

SEP 23 1999 1217



REPLY TO
ATTENTION OF

**DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922**

September 23, 1999

Regulatory Branch (199600168)

CALFED Bay-Delta Program
ATTN: Mr. Rick Breitenbach
1416 Ninth Street, Suite 1155
Sacramento, California 95814


Dear Mr. Breitenbach:

Enclosed please find our comments on the revised Draft Environmental Impact Statement/Environmental Impact Report CALFED Bay-Delta Program, dated June 25, 1999.

Per our correspondence of October 5, 1998, we are providing these comments under the various authorities through which our Regulatory Program is implemented. As described in that correspondence, we believe that this independent review is required under our implementing regulations.

Should you have any questions concerning the enclosed comments, please write to Mr. Jim Monroe, Room 1480 at the letterhead address, or telephone (916) 557-5266.

Sincerely,


Art Champ
Chief, Regulatory Branch

Enclosure

Copy furnished w/enclosure:

CESPK-PD (Pacheco)
CESPK-CO-R

CHAPTER 1 - PROJECT DESCRIPTION

GENERAL COMMENTS

This section is called Project Description, however, it is simply a summary and is, therefore, misleading. The reader expects, from the title, to have a detailed description presented. Instead, the more detailed descriptions are found in Chapter 2, Alternatives. Under NEPA, where all alternatives are analyzed in equal detail, the appropriate title of Chapter 2 should be Proposed Project/Action and Alternatives to the Proposed Project/Action.

1.2 PROJECT DESCRIPTION AND PROGRAM PURPOSE AND NEED

The document states on page 1-6 that the Project Description under CEQA is the same as the Purpose and Need under NEPA. This is, however, not accurate. It is important that the rationale for this assumption is explained. Purpose and Need under NEPA is more comparable to the Objectives which are typically presented in a CEQA document. Under NEPA, the statement of Purpose and Need must specify the underlying Purpose and Need to which the lead agency is responding in proposing the action and alternatives (40 CFR §1502.13). The Purpose and Need is critical to the document because it drives the selection of the range of alternatives. The evaluation and comparison of alternatives should address how well each alternative meets the various needs for the proposed project. The needs presented on pages 1-8 through 1-10 currently consist mainly of historic trends without a succinct, clear statement of the need to be addressed.

On page 1-6 the purpose of the CALFED Program is presented. A Purpose Statement is simply enclosed in a text box. There is no clear explanation of the lead agencies' authorization for the Program and the background of the determination of the need for the Program and its purpose. These must be clearly stated in the Final EIS/EIR.

1.4 PROGRAM ALTERNATIVES DEVELOPMENT PROCESS

Regarding the Summary of Alternatives and as discussed on page 1-18, if the reader does not have the previous March 1998 Draft Programmatic EIS/EIR, then they do not have any idea what Alternative Variation 1C is as described. There needs to be a very clear explanation of such alternatives, including maps. This is a critical short-coming of the document.

CHAPTER 2 - ALTERNATIVE DESCRIPTIONS

GENERAL COMMENTS

The four Program alternatives are not presented in sufficient detail to give the reader/decision-maker a clear understanding of each of the alternatives and their full complement of components. Nowhere in the Programmatic EIS/EIR or its supporting documents, including the June 1999 Executive Summary, the June 1999 Revised Phase II Report, the August 1999 Program Summary, or the August 1999 Program Summary, are the four alternatives fully described. The closest thing resembling a description of the alternatives consists of: *Figure 2-1 General Features of Alternative 1 with a Focus on Delta Facilities*, *Figure 2-2 General Features of Alternative 2 with a Focus on Delta Facilities*, *Figure 2-3 General Features of Alternative 3 with a Focus on Delta Facilities*, and *Figure 2-4 General Features of the Preferred Program Alternative*. However, as can be seen from their titles, components of Alternatives 1 through 3 are presented primarily for the Delta Region. The maps are very difficult to read, and the components are not presented anywhere in text and explained in detail. Despite the caveat on page 2-2 that "The alternatives are not intended to define the site-specific actions that ultimately will be implemented in Phase III of the Program," more information is needed than is provided. At a minimum, the components presented in the figures should be discussed. The maps of the alternatives, as in the March 1998 Draft Programmatic EIS/EIR, are still very poor. For example, one cannot easily find Tracy on the maps. A graphic showing the components assumed as part of the No Action Alternative should be included as well.

2.1.2 Overview of the Eight Program Elements

The eight program elements are satisfactorily described. It would be helpful to the reader if a matrix was also presented, showing the program alternatives, including the No Action Alternative, and the variations of each of the eight program elements described for each alternative.

2.3 ENVIRONMENTALLY PREFERABLE ALTERNATIVE

This section needs a more detailed comparison of impacts between all alternatives that details the differences between alternatives. It is not immediately clear because, as is the problem with Chapter 1, this section is a summary with no reference to other sections. It is not made clear to the reader that a more detailed summary is presented in Chapter 3, until the reader reaches that Chapter. Part of the problem is the lack of a complete Table of Contents in the front of the document. It is unclear why the detailed Table of Contents is located in Chapter 13, which is incorrectly labeled as Index. (That is not a proper index.) The document needs to be revised to be more "friendly" to the reader.

CHAPTER 4 - GUIDE TO IMPACT ANALYSES AND DESCRIPTION OF LAND USE ASSUMPTIONS

4.1 GUIDE TO IMPACT ANALYSES AND DESCRIPTION OF LAND USE ASSUMPTIONS

The prior Technical Reports that support the March 1998 Draft Programmatic EIS/EIR need to be disclosed. For many discipline sections these are key documents, where the analysis is presented. The June 1999 EIS/EIR appears to rely on the materials presented in these documents yet does not disclose their existence. Notification to the public and public availability of these documents should be made.

There appear to be inconsistencies in the technical documents that are considered to be valid for the current EIS/EIR (listed in the front of the bibliography) as well. For example, significance criteria do not match those presented in the current EIS/EIR sections; in fact, fewer criteria factors are presented.

4.3.5 Conveyance

How the acreages presented in each of the tables were derived needs to be explained. It becomes readily apparent that consideration was given only to the "Program" and modifications to the Program as alternatives. This has resulted in a deficiency in complying with the intent of a Program-level NEPA document to analyze a broad range of alternatives to accomplish the objectives/purpose and need of the project. Certainly alternatives exist that could possibly reduce the large expanse of acreage that will be involved in the current proposal.

CHAPTER 5 - PHYSICAL ENVIRONMENT

5.1 WATER SUPPLY AND WATER MANAGEMENT

The text in Section 5.1 is well written in terms of grammar and organization. The authors adopted a systematic format for the Impact Assessment and followed the format most of the time (exceptions noted below). General comments on Section 5.1 are as follows:

1. There are no analyses to determine the impact of all program elements (e.g., Environmental Restoration Program) on water supply and water management. For example, it is stated that the Environmental Water Account (EWA) may allow for more efficient use of water and decrease the conflict in uses of Bay-Delta water supplies. Since decreasing conflict between users is an objective of the program, analyses must be conducted and conclusions drawn regarding the likelihood that program implementation will decrease conflicts.
2. The results of the water supply and management analyses are not presented clearly enough for the reader to determine whether or not an alternative meets the program objectives and/or minimizes impacts to water supply and management.
3. There is too much redundancy throughout Section 5.1. While it is effective in some instances to emphasize an issue through repetition different text should be used to effectively communicate the desired point. The space saved by reducing the redundancy could be used to address more detailed analyses of the program alternatives.
4. There are no reference citations throughout the entire section. References should be included when citing values from past studies and for improving the credibility of the DWRSIM model where possible.

Specific comments are provided below for each subsection.

5.1.1 Summary

It seems as though the document is biasing the Preferred Program Alternative (PPA) from the start of this section by stating, "Water supply reliability could be enhanced under the PPA by increasing the ability to store and transport water, improving the conveyance of water through the Delta, improving the quality of Bay-Delta water supplies, managing demands through increasing conservation and recycling, facilitating water transfer markets, and managing environmental water needs through an Environmental Water Account (EWA)." This statement should also be true for the other alternatives because it is basically a simplification of the program purpose. The real issue should be to explain why the PPA is the best choice for meeting the program objectives. By making this statement at the beginning of the section, the reader may

be inclined to interpret the impact analysis results more favorably for the PPA compared to the other alternatives.

5.1.2 Areas of Controversy

Remove the second paragraph of this section since the same sentence is presented in the middle of the third paragraph.

5.1.2.1 Uncertainties in the Assessment

Climatic changes should be included in this subsection. Future variations (spatial or temporal) in precipitation throughout the study area could have significant affects on the ability of the program to achieve objectives.

5.1.2.2 Addressing Uncertainty

No comments.

5.1.3 Affected Environment/Existing Conditions

Schematic figures and tables should be included in this section to clearly illustrate the storage and transfer volumes throughout the various regions. The figures could be formatted to represent schematic pipe and storage facilities.

5.1.3.1 Delta Region

Page 5.1-5: Provide the annual precipitation, watershed size, and runoff for the Delta Region as was presented in the prior subsection for the entire state.

Page 5.1-6: Describe how the values in Table 5.1-1 were simulated (e.g., DWRSIM model simulations).

Page 5.1-6: Provide a comparison of modeling simulations for existing conditions to actual measurements made at different regional facilities or by various users.

Page 5.1-6: Describe the 73-year historical hydrologic period in more detail. Is it a record of flows or precipitation? Is it spatially discrete or averaged by region?

Page 5.1-6: Provide the rationale for selecting the 73-year historical period and 1995-level land use to represent existing conditions. Discuss the validity of assuming that future hydrology will match past hydrology.

Page 5.1-6: The annual in-Delta use values are not included in Table 5.1-1 as mentioned in the accompanying text.

Page 5.1-6: Define the Sacramento 40-30-30 Index used to classify the dry and critical water years.

Page 5.1-6: The values in the paragraph following Table 5.1-1 do not appear to match the values in the table.

Page 5.1-6: Present any past water use conflicts regarding water supply and water management in the Delta Region. This is necessary to provide a framework for evaluating program impacts to the water supply and water management of the Delta Region.

5.1.3.3 Sacramento River Region

Page 5.1-7: The numbers in the first paragraph do not appear to add up. An average annual runoff of 1 to 2 thousand acre-feet (TAF) per square mile over a watershed of 26,960 square miles yields an average annual runoff of 26.96 million acre-feet (MAF) to 53.92 MAF as opposed to the 22 MAF presented.

Page 5.1-7: The 1906-1996 period mentioned in the third paragraph under Subsection 5.1.3.3 is confusing because it does not match the 73-year period used to simulate existing conditions. It would be helpful to present the annual flow volumes for the same timeframe used to represent existing conditions to allow a meaningful comparison.

5.1.3.4 San Joaquin River Region

Page 5.1-14: The first paragraph states that the average annual unimpaired runoff is about 1.1 MAF near the beginning of the paragraph and that the total annual flow average approximately 1.2 MAF. Please clarify this apparent discrepancy and redundancy.

Page 5.1-16: Replace the word "range" with the word "ranges" in the last sentence of the third paragraph under the subsection titled, "Merced River."

5.1.3.5 South-Of-Delta SWP And CVP Service Areas

No comments.

5.1.4 Assessment Methods

5.1.4.1 Tools

Page 5.1-18: The qualitative methods used to assess impacts from implementation of the Ecosystem Restoration, Water Quality, Levee System Integrity, Water Use Efficiency, Water Transfer, and Watershed Programs should be described in this section.

Page 5.1-18: A brief description of the DWR system operational model (DWRSIM) and DSM2 models should be included in this section, as well as references for prior applications. Past performance evaluations (i.e., comparison between simulated and measured values) should be provided to provide some comfort in the applicability of the model to this programmatic study. Since the models have been used extensively on past water operations projects this information should be readily available for inclusion in the document.

Page 5.1-18: Was the model calibrated and verified for this study with site-specific data? If so, this information should be presented in this subsection. If not, then the rationale for omitting these analyses should be included in this subsection.

Page 5.1-18: Was a sensitivity analysis conducted to determine the variation in model results associated with changes in model parameters? If so, this information should be presented in this subsection. If not, then the rationale for omitting these analyses should be included in this subsection. Sensitivity to some of the input parameters was presented in later subsections; however, the focus here is on model parameters such as variation in friction factors and channel characteristics.

Page 5.1-18: A sensitivity analysis should be conducted to estimate the variability in model results associated with changes in climatic forcing (i.e., hydrology). If it can be shown that climatic variations will not affect the ability to meet program objectives then this should be provided in this subsection.

Page 5.1-18: The last paragraph indicates that the modeling analysis does not consider potential operational changes of non-project facilities with the Central Valley system. The rationale (e.g., relatively small flow volumes) for justifying this assumption should be provided in this subsection.

Page 5.1-18: Describe the spreadsheet models and other analytical tools used to analyze water supply and water management. Include prior applications and references to provide increased credibility of these assessment methods.

Page 5.1-18: The last sentence of the last paragraph states that the simulated monthly flows from the DWRSIM model were used as input to the DSM2 modeling study of the Bay-Delta hydrodynamics. Were field measurements of flow used to check the accuracy of the model results? If so, then the comparisons should be included in this

subsection. If field data was not used then justification should be provided to improve the creditability of the modeling study.

Page 5.1-19: Move the description of the DSM2 model used to analyze Bay-Delta hydrodynamics and water quality to Section 5.2. Explain why the full 73-year historical period was not used for the DSM2 modeling analysis. Present and describe the 16-year period that was used for the simulations and provide a comparison with the 73-year record to show the similarities. Also, provide the list of variables that were simulated to describe the flows in the Bay-Delta.

5.1.4.2 Addressing Uncertainty

Page 5.1-22: Some of the values in the column titled "Storage Components (Maximum Storage Volumes in MAF)" of Table 5.1-2 appears to be incorrect or not described. In particular, the alternative description section presents the following information:

- Up to 3.0 MAF Surface Storage/Groundwater Storage
- Up to 2.0 MAF Off-Aqueduct and In- or Near-Delta Storage
- Up to 0.5 MAF Surface Storage
- Up to 0.5 MAF Groundwater Storage

The table appears to match the first two values (3.0 MAF and 2.0 MAF) and the fourth value (0.5 MAF Groundwater Storage), as well as the total additional system storage of 6.0 MAF. However, the third value above does not appear to match the values in Table 5.1-2. According to Table 5.1-2, 0.25 MAF would be stored in upstream surface facilities of the San Joaquin River Valley and another 0.25 MAF would be stored in groundwater aquifers of the Sacramento River Valley. The alternative descriptions represent 0.5 MAF in surface storage throughout the San Joaquin River Valley so the 0.25 MAF in Sacramento River Valley groundwater storage seems inconsistent. Please cross check Table 5.1-2 with the alternative descriptions to rectify this apparent discrepancy.

Page 5.1-23: Describe how the 2020-level land use projection was made earlier in this section. The details can remain in Attachment A and DWR files; however, the reader should be able to gain a general understanding of the 2020 level land use at this point in the document. Also, when referring to the 2020-level land use estimates (assumptions) the word "projected" should precede the words "2020-level."

5.1.4.3 Modeling Assumptions

Page 5.1-24: In this subsection it is stated that detailed assumptions, such as specific facility locations, were required to conduct the modeling analysis. Based on the results of the DWRSIM model, the sensitivity of water supply and management to assumptions regarding facility location should be presented. The sensitivity should be discussed by

region and within each region so individual users can assess the potential program impacts to their facilities.

5.1.4.4 Approach

Page 5.1-25: Discuss the sensitivity of the model results to the assumptions adopted for allocation of new storage capacity. If the model results and associated conclusions would not be affected by allocation assumptions for new storage facilities then state that in this subsection.

5.1.5 Significance Criteria

Additional significance criteria need to be established to address impacts within regions for individual users or, at least, individual facilities. Based on the current significance criteria, an alternative that reduces the mismatch between Bay-Delta water supplies by improving overall supply and improving conditions for 90 percent (used as an example) of the existing beneficial uses would not be deemed significant. However, the water user(s) that represent the 10 percent affected would probably not consider this an insignificant impact.

Some type of weighting system needs to be incorporated into the significance criteria so that partial fulfillment of some criteria can be quantified objectively (i.e., trade-off analyses).

More quantitative significance criteria need to be established to objectively assess impacts associated with conflicts between water users and environmental needs. Some of the modeling results indicated that exports or carryover storage would be reduced under some alternatives for various conditions; thereby revealing the potential for increased conflicts. Without more stringent criteria (e.g., 10 percent reduction in annual carryover storage for a given facility or 5 percent reduction in average monthly Delta export volume for February) each result must be interpreted qualitatively on an individual basis.

Significance criteria should be developed for each user or facility within each region to better quantify impacts to users and user groups. Regional criteria could be developed (consistent with existing model output) to streamline document length; however, these regional criteria should be justified based on some detailed analyses within each region.

The significance criteria for the qualitative assessment methods used to analyze other program elements were omitted. These criteria should be included in the final document and the impact analysis should utilize these criteria to evaluate significance.

Describe the temporal scale used to define the significance criteria. For example, is an impact considered significant if it increases conflicts between water users and environmental needs during the long term but not during dry and critical years? Would

an impact be considered significant if it increases conflicts between users and environmental needs for only 3 months out of the year?

Define the significance criteria in terms of comparisons to existing conditions and the No Action Alternative. This will help address a case where an impact was considered significant because it increased conflicts between water users and environmental needs relative to existing conditions but not relative to the No Action Alternative.

Based on the assessment adopted for this section (i.e., DWRSIM modeling), the significance criteria should be defined for the parameters analyzed for each region (e.g., Delta inflows and exports for the Delta Region and Delta outflows for the Bay region).

The water quality significance criteria should be moved to Section 5.3.

5.1.6 No Action Alternative

Some of the plots used to present the model results are unclear, especially where many lines are shown on the same graph. A different choice of the line types and symbols will resolve this problem.

A summary should be included at the end of each subsection (region) to clearly communicate the results. A summary table and/or schematic figure is recommended to aid the reader in understanding the results of the model simulations for each region.

The results for each facility should be presented to enable individual users to evaluate the results in the context of the area of interest. Summary descriptions could be provided in the main document and the more detailed results could be referenced in an appendix to meet any space limitations.

More interpretation of the model simulations is needed to explain the physical reasoning for the results. This is especially important for results that seem counterintuitive.

The model results need to be interpreted in reference to the significance criteria. It does not appear that the significance criteria were used to determine if the alternative would result in significant impact based on the model results. This comparison should be clearly described in this subsection and each of the subsections describing modeling results for each of the alternatives by region.

Page 5.1-28: Why is the introduction to this subsection different then the previous regional descriptions? The same format should be used for the impact analysis of each alternative. The introduction for this section is more comprehensive then the preceding subsections so this format is suggested for use under all corresponding subsections.

To improve the understanding of model results the same scale for all graphs of the same information should be used throughout the document. For example, the difference in vertical scales of Figures 5.1-7 and 5.1-8 precludes visual comparison of results forcing the reader to check the values for an objective comparison.

Page 5.1-29: Move the last sentence of the first paragraph under the subsection titled "Surface Storage" to Subsection 5.1.4 where the term "carryover storage" was presented first.

Page 5.1-30: The last sentence of the third paragraph under the subsection titled, "South-of-Delta SWP and CVP Service Areas" states that significantly higher deliveries would not result from the higher demand projections of Criterion B because the system is supply limited in dry and critical years. This seems reasonable; however, the significance of this statement is omitted. Namely, wouldn't the higher demands associated with Criterion B under the No Action Alternative result in an increase in conflict between users and environmental needs because there is a limited supply? If so, wouldn't this be a significant impact based on the significance criteria defined in Subsection 5.1.5? This is an important point to clarify because it goes towards the definition of program objectives. In other words, are the program objectives aimed at resolving conflicts between users based on existing conditions, the No Action Alternative, or both?

5.1.7 Consequences: Program Elements Common to all Alternatives

In general, the rationale for determining the significance of impacts needs to be provided for each subsection. This should include analysis results and comparisons to significance criteria.

Page 5.1-32: Were the effects of flow changes resulting from Watershed Program implementation included in the modeling simulations? If so then include a discussion of how this was done and if not then provide rationale for excluding. Some indication of the potential magnitude (e.g., estimated area of Delta Watershed Program) of this effect is needed to justify ignoring it from modeling simulations.

Page 5.1-32: Does the second sentence in the first paragraph under the subsection titled, "Delta Region" imply that no water would be taken from existing users? If so this is a significant statement that should probably be moved or copied to a more prominent location in the document.

Page 5.1-32: The last sentence of the second paragraph under the title, "Levee System Integrity Program" states that impacts to water supply sources associated with construction of program elements are expected to be mitigable. Since the previous sentence indicated that the significance of the impacts would depend on the scale and rate of construction, how can the impacts be deemed mitigable without some type of analysis? This type of analysis could consist of referencing past project-level EIR/EIS documents for similar types of construction.

Page 5.1-33: Provide the basis for concluding that the water transfers would provide beneficial effects in the paragraph under the subsection titled, "Water Transfer Program." Are there any water transfer scenarios that could lead to an increase in conflicts between water users and environmental needs? If so then this program could have a significant adverse impact and this would need to be addressed. If not then the text should be changed to read that "Water transfers *will* result in more..." instead of "Water transfers *can* result in more..." In addition, this type of statement needs to be backed up with analysis or references.

Page 5.1-33: Provide the basis for concluding that no alterations to channel hydraulics are expected due to modification of levees in the first paragraph under the subsection titled, "Levee System Integrity Program." The analyses and associated criteria used to reach this conclusion should be presented.

Page 5.1-35: The last sentence in the first paragraph under the subsection titled, "Sacramento River and San Joaquin River Regions" states that ecosystem restoration would reduce water supplies available for diversion from rivers and the Delta. The rationale for this statement should be provided and, more importantly, a statement of significance should be made regarding this impact. Would this increase conflicts between water users and environmental needs thereby resulting in a significant impact based on the previously established significance criteria? This issue should be discussed in more detail.

5.1.8 Consequences: Program Elements That Differ Among Alternatives

In general, the rationale for determining the significance of impacts needs to be provided for each subsection. This should include analysis results and comparisons to significance criteria.

Figure 5.1-15 (and similar figures): The legend is confusing. Moving the horizontal bar between the words "No Action Alternative Range and Criterion B" so that it is above the words "No Action Alternative Range" can eliminate the confusion.

Page 5.1-41: Explain why water supply and environmental storage decrease with decreases in demand (i.e., Criterion A) as stated in the second paragraph under the subsection titled, "New Storage."

Page 5.1-42: In the second paragraph under the subsection titled, "Ecosystem Restoration Program Acquisition" it is stated that reservoir operations are likely to accommodate the release pattern for additional in-stream flows. Would there be a significant impact to water supply if reservoir operations could not accommodate the release pattern? Define this impact in terms of significance criteria.

Page 5.1-60: The comparison tables (starting with Table 5.1-9) presenting the modeling results for the various alternatives summarized by region is very useful. What is missing from this subsection and the subsequent subsections for the PPA comparisons is an interpretation of the comparisons. After the results are presented, conclusions should be drawn regarding the significance of the results in relation to the significance criteria. This would be a good place to discuss why the PPA was selected over the other alternatives, especially since the answer is not evident from the presented results.

Page 5.1-66: Delete the sentence in the first paragraph that begins "Therefore, a long-term average carryover storage..."

5.1.9 Program Alternatives Compared to Existing Conditions

The full set of model results should be included in this section so that it is identical to the sections involving comparison with the No Action Alternative.

Pages 5.1-67 and 5.1-68: Remove the description of Criteria A and B from this section since this information has been presented in several locations and the focus of this section should be on comparison of alternatives to existing conditions.

Page 5.1-68: The first bullet item indicates that all potentially significant adverse impacts identified during comparison of the No Action Alternative also would be considered potentially significant when compared to existing conditions. This raises several issues. First, looking back through Section 5.1 there were no potentially significant adverse impacts readily identified for the program element addressed by the modeling study except for the temporary impacts associated with program element construction. If there are impacts they should be clearly indicated in the appropriate subsection. Second, this seems to imply that there is essentially no difference between existing conditions and the No Action Alternative but this can not be valid since it was previously stated that water supply could be adversely affected during dry and critical years under the No Action Alternative. Therefore, there should be differences in the comparisons between existing conditions and the No Action Alternative for some conditions. The question of whether this difference is significant or not needs to be addressed based on comparison with the significance criteria.

Page 5.1-68: Suggest that the preparer reword the third bullet item to read: The effects on water supply availability and reliability determined to be beneficial based on comparison with the No Action Alternative were found to be beneficial based on comparison with existing conditions also.

5.1.10 Additional Impact Analysis

Page 5.1-68: What analyses were used to determine that the long list of projects presented in the third paragraph under the subsection titled, "ADDITIONAL IMPACT ANALYSIS: Cumulative Impacts" will have negligible or beneficial effects on water supply and management? This is a very broad statement that should be justified with analyses or references to prior studies.

Page 5.1-69: Provide the basis for the statement, "Nevertheless, the cumulative effects related to water supply and water management are considered potentially significant" that is presented in the last sentence of the third paragraph on the page. Describe the impacts that are referred to in this discussion since the only impact discussed previously was due to temporary impacts related to program element construction. Define the impacts related to program actions that are alluded to in the beginning of this paragraph.

Page 5.1-70: There does not appear to be a basis for the second paragraph on this page. A quantitative analysis of the benefits and impacts would be needed to reach conclusions regarding benefits outweighing impacts. If these analyses have been conducted then the information should be included earlier in Section 5.1. If no analyses were conducted then this paragraph should be removed completely.

Page 5.1-70: The last sentence of the fourth paragraph describes a critical element of the impact analysis for this section so additional clarification needs to be provided for this issue. Individual users will be focusing primarily on this issue (i.e., how will this program affect me?) to assess the suitability of the overall program. Therefore, the potential displacements of water supplies from regions or uses to other regions or uses needs to be quantified from the DWRSIM results to the degree possible. While use changes may be hard to quantify, the regional changes should be discernable from the detailed model results (i.e., not the rolled-up model results).

5.1.11 Mitigation Strategies

Page 5.1-70: The first two sentences of this subsection seem to imply that the program will implement a mitigation strategy to address decreases (i.e., impacts) resulting from projected actions that would occur under the No Action Alternative. This text should be removed from this section which should focus solely on mitigation strategies for reducing impacts associated with implementation of program alternatives.

Page 5.1-71: The temporary construction-related impacts mentioned in the third paragraph of this page need to be quantified in some manner to estimate a range of impact on water supply and water management. It is not acceptable to state that the impacts can be mitigated to a less-than-significant level without estimating the potential magnitude of the impact.

5.1.12 Potentially Significant Unavoidable Impacts

This statement does not appear to be supported by the impact assessment presented in Section 5.1.

5.2 BAY-DELTA HYDRODYNAMICS AND RIVERINE HYDRAULICS

GENERAL COMMENTS

The text in Section 5.2 is well written in terms of grammar and organization. General comments on Section 5.2 are as follows:

1. There are no analyses to determine the impact of all program elements (e.g., Environmental Restoration Program) on hydrodynamics and riverine hydraulics.
2. The results of the hydrodynamics and riverine hydraulics analyses are not presented clearly enough for the reader to determine whether or not an alternative meets the program objectives and/or minimizes impacts to water supply and management.
3. There is too much redundancy throughout Section 5.2. While it is effective in some instances to emphasis an issue through repetition different text should be used to effectively communicate the desired point. The space saved by reducing the redundancy could be used to address more detailed analyses of the program alternatives.

There are no reference citations throughout the entire section. References should be included when citing values from past studies and for improving the credibility of the DSM2 model where possible.

Specific comments are provided below for each subsection.

5.2.1 Summary

No comments.

5.2.2 Areas of Controversy

Page 5.2- 2: The sixth and seventh sentences of this subsection briefly describe the significance criteria for Sections 5.1 and 5.2, although not stated that way in the document. These criteria should be modified in terms of the assessment methods developed for each section.

5.2.3 Affected Environment/Existing Conditions

5.2.3.1 Delta Region

Page 5.2-4: The last sentence of the second paragraph indicates that tributary inflows and export pumping are the principal variables that define the range of hydrodynamic

conditions in the Delta. This sentence should be modified to refer to average conditions since the tides are a much stronger forcing factor than export pumping as mentioned in the next paragraph of the subsection.

5.2.3.2 Bay Region

No comments.

5.2.3.3 Sacramento Region

Page 5.2-7: Were field measurements made to calibrate or verify the model predictions and analytical calculations for the channel geometries presented in Table 5.2-1? If so this information should be included in the document and if not then the rationale for not using actual field measurements should be included in this subsection.

5.2.3.4 San Joaquin River Region

Page 5.2-9: Was the USGS gauging station data mentioned in the fourth paragraph used to check the simulation results during the period of record and if not, why? If the data were used then the results should be presented and discussed to improve model credibility.

Figures 5.2.2 and 5.2.3: It is stated in the text that the same scale was used for both figures; however, the scales are different. The text or the figures should be modified.

5.2.3.5 Other SWP and CVP Service Areas

Page 5.2-11: Any potential significant impacts that could result from indirect program implementation effects should be presented in the document as well. If there are any potential significant impacts then characterization of existing conditions for Other SWP and CVP Service Areas would be needed in this subsection.

5.2.4 Assessment Methods

5.2.4.1 Tools

The DSM2 information presented in Subsection 5.1.4 should be moved to this subsection and the difference between the DWRSIM and DSM2 models should be defined here.

A brief description of the DSM2 model should be included in this section, as well as references for prior applications. Past performance evaluations (i.e., comparison

between simulated and measured values) should be provided to provide some comfort in the applicability of the model to this programmatic study.

Was the model calibrated and verified for this study with site-specific data? If so, this information should be presented in this subsection. If not, then the rationale for omitting these analyses should be included in this subsection.

Was a sensitivity analysis conducted to determine the variation in model results associated with changes in model parameters? If so, this information should be presented in this subsection. If not, then the rationale for omitting these analyses should be included in this subsection. Sensitivity to some of the input parameters was presented in later subsections; however, the focus here is on model parameters such as variation in friction factors and channel characteristics.

A sensitivity analysis should be conducted to estimate the variability in model results associated with changes in climatic forcing (i.e., hydrology). If it can be shown that climatic variations will not affect the ability to meet program objectives then this should be stated in this subsection.

5.2.4.2 Modeling Assumptions

No comments.

5.2.4.3 Approach

Page 5.2-11: In the first paragraph of this subsection it is stated that an average tide was used for simulations. This tide should be presented and the rationale used for selection should be included in this subsection.

Page 5.2-11: In the second paragraph of this subsection other analysis methods are referred to with regard to impact assessment. The other assessment methods used to estimate impacts should be described in this subsection of the document.

Page 5.2-12: Under the subsection titled, "Delta Region," describe how the stage locations (e.g., Old River upstream of Victoria Island and Middle River at Paradise Cut) were selected for comparison of model results.

Page 5.2-12: Under the subsection titled, "Delta Region," define the term residence time and explain how it was applied to fish eggs and larvae. Present the residence time goals or objectives with respect to residence time here or under the significance criteria.

Page 5.2-12: Under the subsection titled, "Delta Region," present figures, tables, or values to describe the inflow and pumping conditions selected for analysis (February 1979, April 1991, October 1989, and July 1991). Do these values represent the highest inflow, highest pumping, lowest inflow, and lowest pumping conditions experienced

during the period or simply typical values? These values should be compared to the total record of inflows and pumping conditions to convince the reader that these were appropriate choices. This could be done graphically or in text by discussing the range of inflows and pumping conditions experienced during the period of analysis.

Page 5.2-12: Under the subsection titled, "Delta Region," explain why mass was injected at the three selected locations (north Delta at Freeport, central Delta at Prisoner's Point, and south Delta at Vernalis).

Page 5.2-12: Under the subsection titled, "Delta Region," provide the rationale for selecting a 30-day evaluation period to assess the mass tracking results. Was this time needed for numerical modeling purposes (e.g., time needed to reach steady state) or was it selected for physical reasons. What is the time-scale simulated by the DSM2 model and if it is smaller than one month how were the monthly flows provided by the DWRSIM model broken down to smaller time scales?

Page 5.2-12: Under the subsection titled, "Delta Region," mass fate assessments should be provided for water management Criterion A as well as Criterion B and existing conditions. Even though Criterion B and existing conditions may bracket the range of expected results, an analysis of Criterion A conditions is needed to quantify the range of uncertainty associated with the future projection of 2020-level land uses assumed for water management Criterion B.

Pages 5.2-12 and 5.2-13: Under the subsection titled, "Bay Region," justification should be provided for why sediment transport was not evaluated as part of the impact assessment. If implementation of program elements is not expected to impact sediment transport then this should be presented with associated references or supporting analyses. Likewise, if the analyses were not conducted due to analysis limitations (e.g., model requirements) then this should be stated in this subsection. This could be an important issue since the following statement indicates that sediment movement is a dominant transport mechanism for many contaminants and water quality improvement is an objective of the program.

Page 5.2-13: Under the subsection titled, "Sacramento River and San Joaquin River Regions," it is stated that the model results were aggregated for the purposes of presentation. The results for each of the major facilities should be included in this document in summary form so that individual water users can evaluate potential impacts to their operations.

5.2.5 Significance Criteria

Significance criteria should be developed and provided for the Bay-Delta hydrodynamics and Riverine hydraulics to allow for an impact assessment of these physical processes. For example, would a 10 percent increase in stage elevation at Old River upstream of Victoria Island be significant from a hydrodynamic standpoint? Since sediment transport is proportional to some power of the velocity, an assessment of

impacts to channel velocity would be important at estimating potential impacts to sediment transport and associated morphological changes.

5.2.6 No Action Alternative

5.2.6.1 Delta Region

Page 5.2-15: The first sentence under the subsection titled, "Channel Flows: Sacramento River Flow at Rio Vista states that the 1995 WQCP specifies minimum flow rates at Rio Vista from September through December. This information should be moved to the assessment methods section and significance because it provides the rationale for selecting this location and establishes specific criteria (minimum flow rates) to be met.

Page 5.2-15: The first paragraph under the subsection titled, "Channel Flows: Sacramento River Flow at Rio Vista indicates that the flow would be reduced by 12 percent to 17 percent during June and July under the No Action Alternative. Would this level of impact be significant during this time of the year over the long-term? Significance criteria are needed to make this determination.

Page 5.2-16: The first sentence under the subsection titled, "Old River Flow at Bacon Island" states that the flow of water in Old River at Bacon Island is often used as an indicator of hydraulic conditions in the south Delta. References to prior studies should be provided for this statement and it should be moved to the subsection on assessment methods since it provides rationale for the selection of this location for evaluation purposes.

Page 5.2-17: The results of the mass fate tracking analysis for the Delta Region should be presented under the subsection titled, "Mass Fate."

5.2.6.2 Bay Region

Page 5.2-17: The first sentence under this subsection states that the 1995 WQCP established fishery protection measures related to X2 position. This statement should be moved to the subsection on assessment methods since it provides rationale for the selection of this parameter in conducting impact assessment analyses.

Page 5.2-17: Based on the 1995 WQCP criteria for X2 position, state whether or not the changes described in this section would be significant.

5.2.6.3 Sacramento River and San Joaquin River Regions

Page 5.2-18: State whether or not the June and July reductions in average flow described at the top of this page would result in significant impacts relative to Bay-Delta hydrodynamics and riverine hydraulics.

5.2.7 Consequences: Program Elements Common to all Alternatives

Page 5.2-19: The second and third paragraphs indicate that although implementation of the Water Quality Program and Watershed Program would change the Bay-Delta hydrodynamics and riverine hydraulics, these changes are expected to be small so no additional assessment of effects was conducted for these program elements. The potential magnitude of these impacts needs to be provided before determining that additional analysis is not needed. A statement regarding the total expected Watershed Program area and associated analysis could be used to support conclusions.

5.2.7.1 Delta Region

State any significant impacts associated with implementation of the actions described under this subsection. For example, state whether or not implementation of the 10-day spring flow pulses would result in significant impacts to Bay-Delta hydrodynamics and riverine hydraulics based on comparison with significance criteria.

5.2.7.2 Bay Region

State any significant impacts associated with implementation of the actions described under this subsection. For example, state whether or not the increase in shallow-water aquatic habitat and saline emergent wetlands area would result in significant impacts to Bay-Delta hydrodynamics and riverine hydraulics based on comparison with significance criteria.

5.2.7.3 Sacramento River and San Joaquin River Regions

Again, state any significant impacts associated with implementation of the actions described under this subsection. For example, state whether or not implementation of large-scale watershed projects would result in significant impacts to Bay-Delta hydrodynamics and riverine hydraulics based on comparison with significance criteria since it is currently stated in the third paragraph of Page 5.2-22 that large projects could produce large-scale changes in flow regimes.

5.2.8 Consequences: Program Elements That Differ Among Alternatives

5.2.8.1 Alternative 1

In general, the model results are presented clearly and concisely. However, there is no interpretation of the model results providing explanations for the results. In addition, this subsection should include an assessment of the significance of the model results. For example, state the significance of the 1,000-cfs increase in reverse December QWEST flows presented on page 5.2-25.

The first paragraph of this subsection states that the analysis focuses on a few key locations to provide a programmatic overview, which sounds as though a programmatic review is less comprehensive. A programmatic review should be more comprehensive since a collection of projects is being analyzed. While the studies and corresponding results may involve less detail on a site-specific level, the studies must provide adequate coverage of the entire study area. The rationale for selecting these "few locations" should be presented in the subsection titled, "Assessment Methods" to convince the reader that all the important locations within the study area were examined.

Page 5.2-26: In the paragraph under the subsection titled, "Stage," the use of two flow control structures to regulate upstream stage level variation is discussed but it is not clear whether these are existing or new structures. If these are new structures then discuss the implications associated with operation to explain the sensitivity of results to the operational assumptions.

Page 5.2-27: The results of the mass fate transport analysis for Alternative 1 should be presented in this subsection to remain consistent with the effective organization developed for this section. The results can be repeated in Subsection 5.2.8.4 to facilitate comparison between existing conditions and the program alternatives, including the No Action Alternative and PPA.

5.2.8.2 Alternative 2

In general, the model results are presented clearly and concisely. However, there is no interpretation of the model results providing explanations for the results. In addition, this subsection should include an assessment of the significance of the model results. For example, state the significance of the 1,000-cubic feet per second (cfs) increase in reverse December QWEST flows presented on Page 5.2-25.

Page 5.2-33: The results of the mass fate transport analysis for Alternative 2 should be presented in this subsection to remain consistent with the effective organization developed for this section. The results can be repeated in Subsection 5.2.8.4 to facilitate comparison between existing conditions and the program alternatives, including the No Action Alternative and PPA.

5.2.8.3 Alternative 3

In general, the model results are presented clearly and concisely. However, there is no interpretation of the model results providing explanations for the results. In addition, this subsection should include an assessment of the significance of the model results. For example, state the significance of the 7,400-cfs decrease in February flows and 2,800-cfs decrease in September flows presented in the third paragraph of page 5.2-36.

Page 5.2-39: The results of the mass fate transport analysis for Alternative 3 should be presented in this subsection to remain consistent with the effective organization developed for this section. The results can be repeated in Subsection 5.2.8.4 to facilitate comparison between existing conditions and the program alternatives, including the No Action Alternative and PPA.

Page 5.2-38: In the first paragraph under the subsection titled, "Stage," explain why flow control structures are not included with the 15,000-cfs isolated conveyance facility.

5.2.8.4 Preferred Program Alternative

In general, the model results are presented clearly and concisely. However, there is no interpretation of the model results providing explanations for the results. In addition, this subsection should include an assessment of the significance of the model results. For example, state the significance of the 2.1-foot increase in Middle River water levels resulting from implementation of the PPA that is presented in the fourth full paragraph of page 5.2-45.

Page 5.2-44. Table 5.2-5 lists peak positive monthly flow in April; however, according to Figures 5.2-23, 5.2-24, 5.2-44, and 5.2-45 the peak flows for Alternatives 2 and 3 occur in February.

Page 5.2-46: An interpretation of the mass fate tracking results is needed in this subsection to explain the meaning of the results presented in Table 5.2-7. Many readers will not understand the purpose of the analysis or the meaning of the values listed in Table 5.2-7. The reader should have enough information to know whether or not increases in mass tracking percentages are good, bad, or dependent on other factors. These values should also be compared to significance criteria to determine the level of significance for impacts to mass fate.

5.2.9 Program Alternatives Compared To Existing Conditions

The full set of model results should be included in this section so that it is identical to the sections involving comparison with the No Action Alternative.

5.2.10 Additional Impact Analysis

Page 5.2-52: What analyses were used to determine that the long list of projects presented in the fourth paragraph under the subsection titled, "ADDITIONAL IMPACT ANALYSIS: Cumulative Impacts" will have negligible or beneficial effects on water supply and management? This is a very broad statement that should be justified with analyses or references to prior studies.

Page 5.2-52: The fifth paragraph should be moved to Subsection 5.2.11 since the subject matter deals with mitigation strategies. More detail needs to be provided in this paragraph to adequately describe the mitigation strategies.

Page 5.2-52: Provide support for the statement that changes in Bay-Delta hydrodynamics are not expected to result in growth-inducing impacts.

Page 5.2-53: What is the rationale for stating that the Water Use Efficiency, Water Transfer, Water Quality, Water Storage, Water Conveyance, and other program elements can be considered to cause significant irreversible changes to Bay-Delta hydrodynamics and riverine hydraulics. Also, significant impacts specific to Bay-Delta hydrodynamics and riverine hydraulics should be presented in this subsection and not later in the document.

5.2.11 Mitigation Strategies

Mitigation strategies aimed at reducing significant impacts to Bay-Delta hydrodynamics and riverine hydraulics (e.g., unacceptable velocity increases) should be provided in this subsection.

5.2.12 Potentially Significant Unavoidable Impacts

Any potentially significant unavoidable impacts to Bay-Delta hydrodynamics and riverine hydraulics resulting from implementation of program elements should be described in this subsection.

5.3 WATER QUALITY

GENERAL COMMENTS

The maps in this document need extensive revisions for clarification. Many of the figures are difficult to read, and important locations identified in the text are not discernible on the maps due to the extremely small font. Perhaps if certain figures were in color then misunderstandings could be prevented. If so, then blue water areas and light-brown land areas would add significantly to the reader's understanding of topographic features. The figures for location of alternatives also need extensive revisions. Perhaps they need to be foldout figures (11 x 17 inches) to increase the size of the figure in order to make the features more legible. A similar map as Figure 2-1 should be used to show existing conditions and acquaint the reader to the area. This would illustrate direction of flows. The various alternatives could be introduced and highlighted on subsequent maps. Most of the maps show a north arrow but do not show a bar scale to determine sizes of the areas. Bar scales should be included under the north arrows on the maps.

I would recommend that the alternative descriptions in Chapter 2 be expanded to provide more detail on the magnitude of the various elements of each alternative (i.e., increase of channels, duration of construction, and cost of construction).

Overall this section appears to be satisfactory. Much of the discussion of water quality conditions and impacts is qualitative and should be enhanced where ever possible with quantitative data that is referenced. Several sections refer to limited data and significant technical limitations in analysis techniques.

Impacts sections rely on quantitative data for electric conductivity (EC) from modeling results to a large degree. At least qualitative estimates of impacts on water quality parameters other than salinity (and its surrogate measures) should be made for all program conveyance and storage alternatives including the No Action Alternative.

The evaluation of significance of impacts of alternatives is closely tied to the accuracy of the modeling of EC. This is a critical item that needs further analysis regarding significance when comparing alternatives to the No Action Alternative and existing conditions.

Proposed mitigation measures for construction activities seem feasible and effective. Mitigation measures for releases of water from storage areas are hard to assess given the limited information on how that would be accomplished, and how effective it would be. Moreover, there is no discussion of potential impacts of implementing mitigation measures.

5.3.1 Summary

Preferred Program Alternative

The conversions of delta islands from agriculture to wetlands, in addition to increasing total organic carbon (TOC), could increase oxygen demand and will attract water fowl that could increase pathogens in drinking water supplies (see below).

The summary should address the cumulative impact potential of the projects since there are significant impacts. In addition, readers could be referred to Table 3-8.

5.3.2 Areas of Controversy

This section sufficiently summarizes the areas of controversy. The area of discussion of TOC being a precursor of disinfection by-products (DBPs) summarizes other water quality areas pertaining to drinking water protection. These other areas relate how DBPs are formed by chlorination and ozonation used to kill bacteria, viruses, and other pathogenic organisms. These other sections, as well as this area of controversy, do not mention ultraviolet disinfection and the related benefits of eliminating formation of DBPs.

5.3.3 Affected Environment/Existing Conditions

The purpose of this section should be to describe the magnitude and extent of the existing water quality problems in the program area. The reader must be convinced that there are significant problems to be addressed, and that this program is needed and justified. Most of the information is addressed in this section. Nevertheless, the impact and clarity for the reader could be increased by some reorganization of this section. The following format is suggested:

Beneficial Uses

Beneficial uses should be listed for each of the areas (perhaps in table format) with discussion in the text.

Water Quality Objectives

Water Quality Objectives developed to protect beneficial uses should be listed.

Pollutants of Concern

Pollutants of Concern based on exceeding of water quality objectives should be discussed.

In addition to Table 5.3-1, a new table summarizing impairment of beneficial uses for program regions should be created. The Matrix table should have column headings for regions and parameters from Table 5.3-1 for rows. Note sources of impairment data (i.e., 303[d] List).

Activities and Sources that Affect Water Quality in the Region

Address activities and sources that affect the water quality in more than one of the following regions: Sacramento River, Delta, San Joaquin Drainage, San Francisco Bay, and other State Water Project (SWP) and Central Valley Project (CVP) service areas.

Examples: Gold Mine Tailings, Hydraulic Mining, Mercury mining, Agriculture growth, selenium rich soils in San Joaquin, Point and Nonpoint discharges, urban runoff, pasture lands, drainage from Agriculture, etc.

Water Quality Issues in the Delta Region

Water quality and other issues specific to the Delta Region should be discussed. In addition, factors that affect variability of water quality in the Delta Region should also be discussed, as well as a summary of data for key water quality constituents.

Similarly, Water Quality Issues should be discussed for the other, following regions:

Bay Region

Sacramento River Region

San Joaquin River Region

Other SWP and CVP Service Areas

The revised outline for this section would clearly identify the beneficial uses presently being impaired, which water quality objectives would be exceeded, and identify parameters of concern throughout the study area and those specific to subregions.

Completeness of Technical Data to Support Affected Environment Discussions

The completeness of the cited technical data to support affected environment discussions is good for the summary of Data for Key Water Quality Constituents in the Delta. With a few exceptions, the support documentation relies on data from state agencies (Department of Water Resources [DWR] and Regional Boards) and a few studies. Identification of the affected environment is heavily dependent on federal Clean Water Act (CWA) Section 303(d). With the exception of this section of Summary Data for Key Water Quality Constituents, few references are noted for the rest of the discussion areas. In addition, the Water Quality Program Plan (Appendix) does not have any literature cited. It is unclear whether data sources for this Appendix are included in Chapter 12 Bibliography.

The literature cited in the Technical Report on Affected Environment has a total of 42 items which were grouped into the following categories:

| Category | |
|---------------------------------|----------|
| Articles in Scientific Journals | 10 |
| Federal Agency Publications | 7 |
| State Agency Reports | 19 |
| Local Agencies | <u>6</u> |
| Total | 42 |

The majority of the 19 state agency reports are general in nature (water plans, basin plans, toxic substances monitoring, mussel watch, etc.). Three are local 303(b) reports and two are site specific in nature. Of the 10 scientific papers authored by individuals, only four deal with the state of California specifically.

This section on the affected environment, particularly pages 5.3-7 through 5.3-11, could be enhanced with more references to data.

Assessment Methods

Assessment of impacts in the Water Quality section are mostly qualitative for Ecosystem Restoration, Water Quality, Levee System Integrity, Water Use Efficiency, Water Transfer, and Watershed Programs.

Quantitative methods featuring DWR's Delta Simulation Models were used to predict changes in salinity (electrical conductivity) for Storage and Conveyance elements.

The focus of much of this section is on evaluating impacts on salinity in various areas of the Delta. Of particular interest is the conductivity at water entrances to SWP and CVP. Mathematical model predictions are subject to error of the uncertainty of modeling results. The uncertainty of model results needs to be definitively stated in terms of umhos/cm and percent change.

It is unclear as to the uncertainty of the model results from Section 5.3. Conflicting statements as to the accuracy of the model results are presented.

Page 5.3-21 states, "The uncertainty of model results is estimated at approximately plus or minus 10 percent."

- This indicates that the accuracy is plus or minus 10 percent of EC which ranges from roughly 500 to 2000 umhos/cm yielding an uncertainty of plus or minus 50 to 200 umhos/cm depending on the conductivity of the water.

Page 5.3-22 states, "A percentage change between plus and minus 10 umhos/cm is considered within the margin of error of the model analyses and is defined as less than significant."

The wording of this parenthetical sentence suggests that this should read plus or minus 10 percent not 10 umhos/cm.

Accuracy is usually described statistically (i.e., we are 95 percent certain that the actual value is within plus or minus xxx units of the model results). The uncertainty of model results needs to be defined explicitly, not estimated.

The accuracy issue is of critical importance because it is used to determine significance of results. The EC at several locations for each alternative throughout the Delta is compared to the No Action Alternative and to existing conditions. The less than significant level appears to have been set at a 10 percent change between alternatives. If the level of uncertainty in modeling results (+/-10 percent) pertains to the actual estimated EC, then the significance level of comparisons between alternatives should not be set at 10 percent as the uncertainty of these comparisons increases dramatically when they are compared.

When comparing results of model runs for different alternatives, the uncertainties in the difference between Alternatives A and B increase beyond simply adding their uncertainties.

For example: The combined uncertainty that there are no changes in EC between alternatives A and B are as follows:

| Alternative A | | Minus | Alternative B = 0% | | | equals range of Uncertainty |
|-------------------|------|-------|--------------------|------|-----|------------------------------|
| -10% Mean | +10% | | -10% Mean | +10% | | (550-450)/500 = 20% Increase |
| 450 | 500 | 550 | 450 | 500 | 550 | (450-550)/500 = 20% Decrease |
| Total Uncertainty | | | | | | 40% |

Thus, it is imperative that the accuracy of the model predictions be defined specifically in terms of umhos/cm and percentage change for comparison of alternatives. To achieve an uncertainty of +/-10 percent in comparison of alternatives, the uncertainty in predicting EC would have to be +/-2.55 percent.

5.3.5 Significance Criteria

Significance Criteria for water quality are clearly stated. Impacts are considered potentially significant if implementing the Preferred Program Alternative has potential to result in any of the following:

- Beneficial uses of the water are adversely affected.
- Existing regulatory standards are exceeded.
- An undesirable effect on public health or environmental receptors is produced.

Predicted effects that fell with the probable uncertainty of modeling results were considered to be less than significant, with the level set at +/-10 percent. Please note the above discussions of accuracy of model results and resulting level of uncertainty in comparison of alternatives.

5.3.6 No Action Alternative

The No Action Alternative is quantitatively defined by EC model runs. Table 5.3-3a compares existing conditions to that of Year 2020 for the No Action Alternative. The data in this table indicate that salinity will not change significantly throughout the Delta with the No Action Alternative. Largest increases in salinity appear to be generally near the export pumps. These increases in salinity range from 5 to 8 percent for no storage annual averages and are 6 to 8 percent for the month of Maximum EC. These slight increases in salinity would be reduced with storage. This is judged to be less than significant. These slight changes in salinity are shown to have a beneficial effect in Table 5.3-3a and b in the impact assessment. Why would increases in salinity have a beneficial affect? These are probably in error and should be reviewed.

Qualitative Assessments of Other Water Quality Parameters

What would happen to other water quality parameters if this Program is not conducted? How much would other activities and programs (like increased treatment levels for wastewater discharges, storm water management, new controls on grazing lands, levee maintenance, etc.) improve water quality over the next 20 to 30 years? These qualitative assessments need to be made for this alternative.

Notes on Tables Comparing EC Conditions for Various Alternatives

The text on Assessment Methods needs to describe what is presented in the series of tables comparing alternatives. It should state that the tables compare alternatives to the no action alternative for the long term (at year 2020) using various water scenarios. Also, the table column heading of "Annual Change" is somewhat confusing since it could be interpreted as change per year (i.e., be cumulative, 5% per year for 20 years).

5.3.7 Consequences: Program Elements Common to all Alternatives

Ecosystem Restoration Program

The reader's understanding of this element would be enhanced by showing potential locations where these flooded areas would be located.

The preferred alternative without storage results in a small decrease (3 to 6 percent) in the annual average at export pumps, but a significant (?) change in the monthly maximum (20 to 24 percent change). Moreover, significantly reduced salinity occurs with storage.

Evaluation of Alternatives

Evaluation of the various alternatives could be enhanced by a new figure that compares all alternatives on one graph. Graphs would be similar to those of Figure 5.3-7, but would include all four alternatives (differentiated by colors) to the No Action Alternative. This would be a good summary type figure that would compare ranges of salinity for all alternatives and could be prepared for each of the locations.

A new table could also summarize the amount of reduced salinity between the No Action Alternative and each of the alternatives at export pump locations. This would tend to increase the perceived benefits by illustrating the difference between small increases in salinity for the No Action Alternative to decreases in salinity for the preferred and other alternatives.

Comments on Figures for Range of Salinity

Figure captions could relate location (i.e., Clifton Court # 27) to Figure 5.3-1 which shows locations.

The legend on the right side of figures is somewhat confusing considering the first time these figures occur is in the preferred alternative presentation (Figure 5.3-2). Graphs for the preferred program alternative show that salinity is lower for Criterion B with storage for each location (Figures 5.3-2 through 6) while the legend shows Criterion B on top of Criterion A. It is suggested that the legend be redone on these figures to show Criterion A above and Criterion B below. This should be followed consistently throughout the rest of these figures. (For Figure 5.3-2, Criterion B and A are incorrectly identified pertaining to storage.) Figure 5.3-9 shows that dry and critical years salinity is off-scale? The graph must be rescaled to show data.

5.3.9 Program Alternatives Compared to Existing Conditions

This section compares program alternatives to existing conditions instead of the previous comparisons to No Action Alternative. Since there were no major differences between existing conditions and the No Action Alternative, this section seems redundant (although it is required by the process). Minimizing the extent of this section may be helpful to the reader.

5.3.10 Additional Impact Analysis

Cumulative Impacts

This sections states that past, present, and probable future projects have been evaluated for their potential to create cumulative effects when combined with the preferred program alternative. It then states which project would result in negligible effects on water quality projects which have already been considered in the environmental analyses for this Program. Eight projects are listed that would result in cumulative effects that are considered potentially significant and would affect salinity, bromide, total dissolved solids (TDS), TOC, temperature, dissolved oxygen, water use organic and inorganic suspended solids. The section gives no data or details of how this would cause potentially significant impacts on water quality. This leaves the reader wondering if the Program is supposed to fix these problems, and why this program in conjunction with these other programs would result in potentially significant impacts on water quality in every region and on most of the parameters of interest.

5.3.11 Mitigation Strategies

Ecosystem Restoration Program

Mitigation strategies for the restoration program address TOC. In reference to the previous discussion, there is a potential for increased BOC, bacteria, and pathogens with this program, and mitigation strategies for these potential problems should also be addressed.

The remaining sections appear to address reasonable mitigation strategies.

Miscellaneous Items

Pathogens

Page 5.3-13 relates DWR's Coordinated Pathogen Monitoring Program with samples at 14 stations in the SWP service area. Are these sampling locations downstream of water treatment facilities? If so why is *Giardia* found in 26 percent of samples and *Cryptosporidium* found in 8 percent of samples?

5.6 NOISE

GENERAL COMMENTS

The Linkage Between Noise, Transportation, and Air Quality Sections

The noise, transportation, and air quality sections are closely integrated sections that need to be carefully linked together. Construction and operational traffic projections become part of the data used in the analyses of both air quality and noise impacts.

There are inconsistencies between the transportation, noise, and air quality sections. There is discussion of the potential for relocating several miles of local roads, highways, and bridges in the transportation section in Section 5.7.8.1. However, in Section 5.6.8.1 of Noise, there is no mention of noise impacts associated with relocated roadways, bridges, etc., for the pilot diversion project. Further, if land uses change as a result of retirement of agricultural lands, as mentioned in Section 5.8, there could be associated increases in noise and transportation. This issue is not addressed in either Section 5.6 or 5.7 for the Preferred Program or alternatives.

This section is extremely general and could benefit from a description of a range of impact significance criteria that will need to be adhered to. This would include the typical range of criteria covered by local noise ordinances (i.e., 60-70 dB), along with typical restrictions (i.e., hours of operation restricted to 7 a.m. to 7 p.m. with no work on Sunday, etc.). It should also include a range of typical construction equipment, pump noise, etc. to be used and their attenuation distances. This would help the reader understand potential impacts, especially those who may be proximate to potential identified construction areas.

It appears that the general area of certain Program Element actions is identified. For those areas, more information needs to be provided at this level of analysis. For example, if the general area of the pilot program at Hood is known, then the types of sensitive receptors that could be affected by construction noise should be generally identified at this time in the programmatic analysis. This section needs to be revised to reflect such information to the best of its ability and analyze the potential impacts accordingly. Without some level of information, upon which to realistically gauge potential impacts, the document may be deficient.

A discussion of the effectiveness of certain types of mitigation, such as mufflers and soundwalls could also be presented. This would set the basis for future analysis of specific projects.

The programmatic mitigation should require that site specific noise analyses be conducted for future actions.

5.7 TRANSPORTATION

GENERAL COMMENTS

Here, as in the other resource analysis sections, the discussion of impacts upon transportation as a result of the proposed project are very general, offering the reader no clear sense of where impacts are likely to occur, or the magnitude, even at a programmatic level, of those impacts.

5.7.7 Consequences: Program Elements Common to all Alternatives

On page 5.7-10, regarding storage, the document identifies less than significant impacts associated with operations. However, new reservoir projects could increase recreational use, which has the potential to substantially increase traffic. Mitigation should require that future EIRs and EISs for project-specific actions include traffic assessments and analysis of traffic associated with increases in recreational opportunities resulting from new reservoirs, and other land conversions to recreational uses.

5.7.8.1 Preferred Program Alternative

There is discussion of the potential for relocating several miles of local roads, highways, and bridges. Please identify these potential roadways. Mitigation should require traffic studies for future project-level environmental traffic analyses.

5.8 AIR QUALITY

GENERAL COMMENTS

Further air quality analysis or substantiation is required for the reader or agency to make an informed decision on whether or not significant unavoidable impacts would "really" occur. For example, there is no way of knowing at this time whether potential increases in air emissions associated with higher residential, commercial, or recreational land uses resulting from implementation of the Program may occur, or what those levels would be. Yet, the EIS/EIR preparers conclude (pages 5.8-16) that "No potentially significant unavoidable impacts on air quality are associated with the Preferred Program Alternative." To the contrary, significant unavoidable construction as well as operations impact could occur from intensive development and associated traffic. The EIS/EIR fails to disclose this potential impact fairly. A small project can easily exceed threshold levels even with a small number of pieces or equipment operating simultaneously or by the addition of new land use activities and traffic.

The issue of the effects of land use conversions is also not addressed in the presentation of Growth-Inducing impacts (pages 5.8-17). This potential impact could be of great consequence to the future regional planning process. Mitigation strategies could include a plan to work with local and regional planning jurisdictions to identify those areas subject to agricultural land conversion for advance planning for those areas.

CHAPTER 6 - BIOLOGICAL ENVIRONMENT

6.1 FISHERIES AND AQUATIC ECOSYSTEMS

GENERAL COMMENTS

The CALFED documents contain a wealth of information on the fisheries and aquatic ecosystems of the Bay-Delta area. The three volumes that comprise the Ecosystem Restoration Program Plan as well as the Multi-Species Conservation Strategy Appendix are virtual encyclopedias of information on the resources of the Bay-Delta area. The information in these volumes is accurate, well researched and, for the most part, reasonably well documented. However, the Draft Programmatic EIS/EIR does not do a good job of presenting and integrating this information. The EIS/EIR volume should summarize all relevant information and present it in a way that the reader can clearly identify significant impacts and the reason impacts were deemed significant. The analysis should make it easy for the reader to distinguish differences in benefits and adverse impacts between alternatives. The EIS/EIR should be a stand-alone volume with enough information that the reader only needs to refer to other volumes for more detailed information. In general, the integration of the material in the other volumes and the EIS/EIR is poor. Where relevant detailed information in the Ecosystem Restoration Plan volumes is not presented in the EIS/EIR, the EIS/EIR should direct the reader to the exact sections in the other volumes where the supporting information can be found.

Because of the large geographic scope, the large number of actions, and the programmatic nature of the document, there are obvious difficulties in presenting this material in a manner that is clear and logical for the reader. It is obviously hard to present enough technical detail and yet keep the main document small enough that the reader can still lift it. On the other hand, there is a great deal of repetition. The same sentences and paragraphs are repeated over and over. To the extent that generic information can be replaced by information specific to each alternative, the clarity of the document may be increased without greatly increasing its size. Techniques that would help to present the complexity of information in an understandable manner and that are very much underutilized in the EIS/EIR are:

1. More graphics. There is a shortage of graphics and the graphics that are used are hard to read. Many features discussed in the text are not shown clearly on a map.
2. More summary tables. A great deal of information can be presented in tables.
3. As mentioned above, specific references to where more detailed information on a topic can be found in the supporting volumes.
4. An actual index in the main EIS/EIR would be helpful. The index presented is just the table of contents. This detailed table of contents with all the sub-sections should be substituted for the Table of Contents and a real index by topics listed alphabetically should be presented.

5. A glossary. Supporting volumes contain glossaries but one is missing from the EIS/EIR.

The presentation of alternatives in Chapter 2 is considerably improved over the discussion in the March 1998 draft. It is helpful that in this June 1999 draft, the programs and elements common to all alternatives are more clearly identified and presented. The discussion of generic actions for the Ecosystem Restoration Program pages 2-7 to 2-8 should specifically refer the reader to Ecosystem Restoration Program Plan Volume 2 – Ecological Management Zone Visions in which each of the generic actions is described in great detail for every management area. The text only refers the reader to the Ecosystem Restoration Program Plan and does not specify the volume where the detailed information can be found. More specific cross-referencing will help the reader sort through the maze of information. Because development of increased surface storage could potentially have considerable impact, it would be helpful to include the table listing the most likely sites for surface storage from p. 91 of the Revised Phase II Report to accompany the text on p. 2-14.

The summary table on page 3-13 does not make it easy to compare alternatives. The table should clearly identify potentially significant adverse impacts of each alternative. It would also be helpful if the table provided some kind of quick comparison of the magnitude of beneficial impacts. The summary tables 7.1-1 and 7.1-2 in the March 1998 Draft represent a useful approach. Perhaps an abbreviated version could be developed for the summary section.

6.1.1 Summary

This section does not clearly distinguish the relative impacts and benefits of the alternatives. As mentioned under general comments, tables similar to 7.1-1 and 7.1-2 in the March 1998 Draft would be immensely helpful. The reader should be able to read this section and immediately grasp the differences in impacts and benefits of the alternatives. The way information is presented in that document is almost impossible to do. The list of potentially significant adverse impacts and mitigation strategies is very good. It would be helpful if this discussion were expanded into a larger table to include an indication of which alternatives and which programs (Ecosystem Restoration, Storage, Conveyance, etc.) each potentially significant impact resulted from. The table should also list by which of the impact significance criteria, the impact was determined to be potentially significant.

6.1.2 Areas of Controversy

The discussion of uncertainty contained in this section is good.

6.1.3 Affected Environment/Existing Conditions

This section does a good job of succinctly describing ecosystem problems and summarizing some of the complex processes in the project area, but it does not adequately identify and describe resources of concern. Like much of this document, this section suffers from a lack of maps. A map should be presented showing each region with the features mentioned in the text identified. For example, on page 6.1-12, the text refers to a section of the Sacramento River from Chico Landing to the Delta as being between levees. The reader needs to see where this is. On the same page, the text mentions all the reservoirs, however, it is unknown where they are located.

The section is particularly lacking in identifying and discussing species and/or communities of concern. The reader gets very little information in this section on what and where important fishes and other aquatic resources are. In contrast, Ecosystem Restoration Program Plan Volume 1 – Ecological Attributes of the San Francisco Bay – Delta Watershed, Ecosystem Restoration Program Plan Volume 2 – Ecological Management Zone Visions, and Multi-Species Conservation Strategy are treasure troves of information. Page 6.1-8 refers the reader to the March 1998 Fisheries and Aquatic Resources Technical Report for detailed information on the life history, historical population abundance, and factors affecting production for specific species, but the Technical Report is not part of the EIS/EIR package readily available to the public. Most of the information in the Technical Report (and more) is in the Ecosystem Restoration Program Volumes 1 and 2 and the Multi-Species Conservation Strategy Appendices. The reader should be referred to those documents rather than the much-harder-to-access Technical Report. However, because the Appendices are so large and contain so much information, the reader should be directed to exactly what information is where. For example, detailed information on the ecology of species of interest is found in the section, Species and Species Group Visions on pages 172 to 420 of Ecosystem Restoration Program Plan Volume 1 – Ecological Attributes of the San Francisco Bay – Delta Watershed. Even Volume 1 of the Ecosystem Restoration Program Plan does not adequately specify the locations of most of these species of interest.

Much valuable information on fisheries and aquatic resources could be presented in tables. The Multi-Species Conservation Strategy Technical Appendix contains tables, such as Table 2-2, of the sort that would be very valuable in the EIS/EIR main volume. At a minimum, Section 6.1.3 must have a table showing listed aquatic species in the project area with the legal status (Federal Threatened, State Endangered, etc.) of each species. For listed species for which Critical Habitat within the project area has been designated, there should be maps showing where that critical habitat is. For all listed species, locations within the project area should be identified either by map or by table. For each of the listed species, it would also be helpful if the text contained a brief (2 or 3 paragraph) about relevant aspects of their biology. The short species descriptions starting on page 56 of Ecosystem Restoration Program Plan Volume 2 – Ecological Management Zone Visions are an example of the kind of brief biological summary that could be presented in the main EIS/EIR. If any of the aspects of the listed species' biology are used in the impact determination, then the information needs to be

presented in Section 6.1.3. For example, in the impact analysis species with specific sediment requirements are mentioned (i.e., spawning gravels for chinook salmon and steelhead on page 6.1-18). Important species life requirements relevant to the impact analysis need to be identified in *Section 6.3.1 Affected Environment/Existing Conditions*. Another example would be on page 6.1-16 where water temperature is discussed as a fundamental ecological process and yet optimum water temperatures for species of interest are not identified as important in the Affected Environment/Existing Conditions section. If other species of interest, such as striped bass or American shad, are to be considered in the impact analysis, then they need to be identified and discussed in Section 6.3.1. The best way to present information would be in a table similar to Table 2-2 of the Multi-Species Conservation Strategy Technical Appendix. The table should identify all species of interest considered in the impact analysis, state why they are considered important for the impact analysis (support sport fishery, etc.), and identify their location within the project area.

6.1.4 Assessment Methods

The methodology used to determine impacts is a rational approach that is carried out consistently throughout the analysis. The problem is that at the level of analysis presented in this document, the approach makes it very difficult to distinguish significant from less than significant impacts. Because most program actions will affect the processes discussed under Ecosystem-Level Analysis to some degree, it is unclear at what level of effect an impact is determined to be a "significant adverse impact" rather than an "adverse but non-significant" impact. The ability to distinguish significant adverse from non-significant impacts is the very crux of impact analysis. As discussed in the comments on Section 6.1.5. Significance Criteria, it may be better to base the determination of significance on impacts to species or habitats, and use some of the methodology presented in the Ecosystem-Level Analysis as a way of identifying impacts to species. The methodology followed in this EIS/EIR in which Ecosystem Level impacts are discussed followed by Species-specific Analysis is redundant and tedious. Furthermore the lengthy discussion in this section of how various changes in processes might affect either ecosystem processes or species would be better incorporated as a justification for the determination of specific impacts in *Section 6.1.7 Consequences: Program Elements Common to All Alternatives* and *Section 6.1.8 Consequences: Program Elements that Differ Among Alternatives*. The impact analysis in these sections contains little explanation about how a project action might affect fisheries and aquatic ecosystems. One cannot expect the reader to flip back and forth between the analyses in Sections 6.1.7 and 6.1.8, and the discussion in *Section 6.1.4 Assessment Methods*. Section 6.1.4 should be cut down to a much briefer discussion of methodology and the affects of project actions on various processes moved to the Consequences sections.

The analysis of changes in flow, discussed on pages 6.1-15 and 6.1-16, presumably uses the results of the hydrodynamic and hydraulic modeling presented in *Section 5.2 Bay-Delta Hydrodynamics and Riverine Hydraulics* to determine changes in flow. A very detailed discussion on how impacts of flow changes were analyzed is presented on page 4-10 of CALFED Technical Report Environmental Consequences Fisheries and

Aquatic Resources. Presumably this was the same methodology used to evaluate the impacts of changes in flow from the four alternatives analyzed in the June 1999 document. Because changes in flow are potentially one of the key differences amongst alternatives, this methodology needs to be more clearly described. If the modeling discussed in *Section 5.2 Bay-Delta Hydrodynamics and Riverine Hydraulics* was used as the basis of determining flow changes then Section 5.2 needs to be specifically referenced in Section 6.1.4 Assessment Methods. The methodology as described in the Technical Report seems sound and well supported, it just needs to be explained better in the EIS/EIR so the reader can understand the reasoning behind the determinations.

On pages 6.1-20 through 6.1-22, the introduction of Productivity and Structure as processes for the Ecosystem-Level Analysis introduces concepts that are redundant with other analyses and almost impossible to quantify based on the level of detail presented in this document. Productivity is assumed to increase if other processes such as reduction in contaminants and re-establishment of more natural flows occur. Productivity could best be addressed by re-focussing the impact analysis to the Species-Specific Analysis. Structure could probably be more directly addressed in terms of habitat. In other words, changes in structure as discussed on pages 6.1-21 and 6.1-22 appear to relate primarily to changes in floodplain habitat.

On page 6.1-22, the introduction to the Species-Specific Analysis refers to species having significant social and political value. This section needs to state clearly what species were used for the impact analysis. In the March 1998 Programmatic EIS/EIR as well as in the March 1998 Fisheries and Aquatic Resources Technical Report a list was included of species selected for inclusion in the fisheries impact assessment. Such a list needs to be included in the June 1999 EIS/EIR along with the reason each species was chosen for the analysis. Species abundance is usually closely tied to habitat so the relationship between impacts to species and changes in habitat discussed on pages 6.1-22 through 6.1-24 is reasonable and supportable. However, page 6.1-23 refers to habitat abundance. Sections 6.1-7 and 6.1-8 need to present much more information quantifying changes in habitat abundance.

The discussion of entrainment on pages 6.1-24 to 6.1-25 is an example of a discussion that is better moved to the impact analysis in Sections 6.1.7 and 6.1.8. The first time entrainment is introduced as an impact, it would be appropriate to discuss the various negative impacts entrainment can have on fishes. By coupling the discussion with the identification of a specific impact the impact analysis section will be better supported, and the reader will need to do less skipping back and forth between sections. Furthermore, if entrainment is an important impact, *Section 6.1.3 Affected Environment/Existing Conditions* should identify for the reader what target species and what life stages of these species occur near existing and proposed intakes. Then throughout the impact analysis, the potential significance to species affected by each proposed and existing impact can be evaluated.

Again, as was true for entrainment, water-surface relationships might be briefly introduced in *Section 6.1.4 Assessment Methods* but the more detailed discussion should be moved to Section 6.1.7 or Section 6.1.8 and tied to an actual identified impact.

Similarly, the discussion of Movement Relationships on pages 6.1-26 through 6.1-28 is too long. Some of the information on existing movement relationships would be more appropriate in *Section 6.1.3 Affected Environment/Existing Conditions*. Some of the rest of the discussion would be better tied to identification of specific impacts on movement in Sections 6.1.7 and 6.1.8.

Artificial production and harvest are only minimally tied to CALFED actions. They are not really considered in the comparison of alternatives in Section 6.1.8. The discussions on pages 6.1-28 and 6.1-29 should be deleted. These topics can be introduced briefly if really necessary under the discussion of the Ecosystem Restoration Plan impacts in *Section 6.1.7 Consequences: Program Elements Common to All Alternatives*.

In general, the impact analyses in Sections 6.1.6, 6.1.7, and 6.1.8 provide very little documentation or discussion of the nature of impacts. For example, it is mentioned that sediment movement can have adverse impacts on aquatic resources during construction of facilities, but there is no discussion or documentation of sedimentation impacts on aquatic resources even though a voluminous literature on such effects exists. Similarly the text identifies disturbance of aquatic communities as an impact, but it presents no supporting literature on the amount of time it takes aquatic communities to recover from impacts such as dredging. Detailed documentation of impacts is presented in the Fisheries and Aquatic Resources Technical Report Environmental Consequences only for flow impacts. The discussion on flow impacts is good although hard to follow and not carried into the EIS/EIR main document. Because of the lack of documentation on other kinds of impacts, it is impossible for the reader to discern if impacts identified in the text are supported by the data. No data are presented.

6.1.5 Significance Criteria

The significance criteria for beneficial impacts on pages 6.1-29 and 6.1-30 are good. The significance criteria for adverse impacts on page 6.1-30 are generally not standard. Although the approach of basing the impact analysis on processes and structural characteristics of ecosystems is well-reasoned and carried consistently throughout the impact analysis in Sections 6.1.7 and 6.1.8, this approach makes it difficult to distinguish significant from non-significant impacts. As discussed above under *Section 6.1.4 Assessments Methods*, it would be better to use more standard species and habitat based significance criteria and use the consideration of changes in processes (as presented under Ecosystem-Level Analysis) as a means of identifying significant impacts to species or habitats of interest. Therefore, the following standard significance criteria are suggested:

A significant adverse impact occurs if:

- any part of the population of a threatened or endangered species is directly affected or if a significant component of its habitat is lost or disturbed, or if designated critical habitat is adversely modified;
- if a net loss occurs in the functional habitat value of a sensitive biological habitat (habitats considered sensitive for the purposes of this analysis should be defined specifically);
- if the movement or migration of fish or wildlife is impeded; and
- if a substantial loss occurs in the population of any aquatic species with economic or social value (these special interest species, which presumably would include such species as striped bass and American shad, should be defined by a list of species considered in the analysis) or if there is an overall loss of biological diversity. Substantial is defined as any change which could be detected over natural variability.

6.1.6 No Action Alternative

The discussion on page 6.1-30 and at the top of page 6.1-31 identifies that there could be adverse impacts on populations from increased input of contaminants. The discussion does not identify if the impacts could be significant. If impacts are significant by the significance criteria, this needs to be stated. A determination of significance would need to consider if increased contaminants would occur near areas where target species are and if these contaminant loads are likely to reach levels that exceed water standards for the protection of aquatic life in any of these areas.

On page 6.1-32, the potential increase in water temperature from reoperation of Folsom Reservoir seems like a potentially significant adverse impact because it could affect the spawning habitat of two listed species, steelhead and chinook salmon. If so, this should be identified as a potentially significant adverse impact. The same comment applies to the discussion under Section 6.1.6.4 San Joaquin River Region on page 6.1-32 on the impacts of reduced reservoir storage for flow provided for the Vernalis Adaptive Management Plan (VAMP).

In general, the analysis in Section 6.1.6 No Action Alternative is reasonable.

6.1.7 Consequences: Program Elements Common to All Alternatives

It is a very good idea to discuss these programs common to all alternatives in a separate section as is done here. This approach reduces confusion by helping to focus the alternatives analysis on the differences between alternatives.

The discussion in this section is very broad and very general and gives little specific information about the benefits and potential adverse impacts of these programs. Because the programs are common to all alternatives and because they are designed to be beneficial to the environment, this is not a fatal flaw. However, there is enough information in the supporting documents (for example the Ecosystem Restoration Program Plan Volume 2 – Ecological Management Zone Visions Technical Appendix and the Multi-Species Conservation Strategy Technical Appendix) to perform a much more detailed analysis. In the Ecosystem Restoration Program Plan Volume 2 – Ecological Management Zone Visions specific actions at specific locations are described. These actions could be analyzed quantitatively to actually define benefits and impacts. Tables such as Tables A through D in the Multi-Species Conservation Strategy could be used to summarize impacts. Such tables would need a column identifying whether each measure had potential significant adverse impacts. One analysis that is missing from this section is a consideration of whether actions that would benefit one target group of species such as listed salmonids might have an adverse effect on another group of target species. For example, what would be the impacts on striped bass of predator control at intakes since striped bass would be one of the predatory species being controlled? Although a reduction of water temperatures would benefit salmonids, would water temperature reduction have potentially significant impacts on target species with a preference for warm water?

Specific comments on this section are presented below. Because the discussions in this section are repetitive from region to region, specific comments are made once and not repeated for similar discussions for each of the following regions.

In several places in the document including the summary discussion on page 6.1-4 and the more detailed discussion on page 6.1-35, the analysis identifies that benefits to invasive species may be an unavoidable significant adverse impact of habitat restoration. This is an important conclusion that is counterintuitive and seems to conflict with statements elsewhere in the documentation that native habitat presumably favors native species over non-native species. If increase in invasive species at the expense of target species is really a likely adverse impact of habitat restoration more supporting documentation needs to be provided. For example, are there any case histories that could be cited in which a habitat restoration project had an adverse impact because it caused an increase in a predatory or invasive species that then went out and reduced the populations of target species?

Under the Levee-System Integrity Program, the discussion on page 6.1-37 mentions potentially significant impacts on aquatic species from construction. This sentence on potentially significant adverse impacts from construction is repeated over and over throughout the impact analysis. Somewhere, perhaps here because this is the first time construction impacts are identified, a more detailed analysis of potential construction impacts needs to be presented. For example, what are all the harmful impacts that mobilization of sediment can have on aquatic communities? What are the specific concerns related to input of contaminants from construction? Is the concern spills and leaks of toxic substances like fuels, mobilization of contaminated sediments or

both? A full discussion of potential construction impacts needs to be developed. This discussion can then be summarized or referenced in later sections.

The discussion of potential storage impacts on pages 6.1-38 and 6.1-39 is good because it identifies specific impacts such as an increase in magnitude of reverse flow in Old and Middle Rivers and identifies which species would be affected. Some of the discussion of Movement Relationships on pages 6.1-26 through 6.1-28 could be moved here to explain why reverse flow is detrimental to target species. One potential adverse impact of storage not discussed here is the benefit to invasive species of enlarging or creating reservoirs particularly within stream channels. In contrast to the restoration of natural habitats, which intuitively would seem to favor native species, the creation of reservoir habitat would probably favor invasive species.

The discussion on pages 6.1-39 through 6.1-41 on consequences of the Ecosystem Restoration Program in the Bay Region and on pages 6.1-42 and 6.1-43 on consequences of Storage in the Bay Region should mention that increased outflow that would move X2 seaward would benefit target species such as Delta smelt and striped bass but might have detrimental effect on marine species of value such as northern anchovy.

On page 6.1-47 under Storage the text refers to simulated flows. Apparently the analysis is based on the modeling presented in *Section 5.2 Bay - Delta Hydrodynamics and Riverine Hydraulics*. That section should be referenced if it provides the support for the analysis in Section 6.1-7. Again, the last paragraph on page 6.1-47 identifies the creation of additional aquatic habitat in reservoirs as having limited value as aquatic habitat but does not mention that reservoirs would favor the development of invasive species which may in some cases be released downstream where they would eat or compete with native target species.

6.1.8 Consequences: Program Elements that Differ among Alternatives

This section needs to be much more detailed and specific. This section is the most critical part of the analysis in this document, because it should provide enough information for the reader to make decisions about the choice of alternatives. It is extremely difficult, based on the way the information is presented in this section, for the reader to understand the differences in potential benefits and adverse impacts among alternatives. Because the locations of diversions, channel enlargements and other features for each alternative are known, the analysis can and should be specific about which target species will be affected by each proposed feature and how important the affected area is to the population. Adverse impacts need to be identified clearly as to whether the impact is significant or insignificant, and the specific significance criteria used to make the determination need to be identified. Although the discussion in this section is well reasoned, to actually compare alternatives more quantitative details need to be provided. For example, approximately how much aquatic habitat would be affected by the proposed enlargement of the Old River channel north of Clifton Court Forebay (page 6.1-50)? What species use this habitat during what time of year?

Could significant impacts be avoided by seasonal restrictions on dredging? How much aquatic habitat would be affected by the pilot diversion structure from near Hood to the Mokelumne River (page 6.1- 52)? The text does provide useful information about which species could be affected by each proposed action, but more detail needs to be supplied about the importance of the affected area to target species and some idea of the magnitude of the impact. For example, do any of these proposed facilities have the potential to affect designated critical habitat to listed species? What life stages of the target species might be affected? The kind of detail mentioned above would help to provide the reader with a much fuller understanding of potential impacts and also might help to distinguish differences between alternatives.

The discussion of flow control barriers on page 6.1-51 is basically sound because each proposed barrier and the species it could affect are identified. However, again the reader needs to be provided with information about the importance of the potentially affected areas to each target species. Because the conveyance options that differ amongst alternatives are in the Delta, one approach would be to provide a much-expanded discussion of aquatic resources of the Delta in Section 6.1.3 Affected Environment/Existing Conditions. That section could specifically discuss the aquatic resources present in the areas that might be affected by proposed facilities under the different alternatives. Section 6.1.8 Consequences: Program Elements that Differ among Alternatives could then refer back to the Delta aquatic resources section in the impact discussion. The other problem with the discussion of South Delta Flow Control Barriers on page 6.1-51 (as with other discussions in Sections 6.1.7 and 6.1.8) is that impacts are identified that have not been explained. For example the third full paragraph states that the construction of barriers on other south Delta Channels could alter basic hydraulic features that affect water quality conditions including water temperature and dissolved oxygen. The text needs to supply more supporting documentation to explain why these barriers might reduce oxygen levels or alter temperatures to an extent that would affect target species. Similarly, why would sediment and nutrient movement be affected to such an extent that the channel would no longer function to support target species?

For construction impacts in the discussion in Section 6.1.8.1, it should be possible to be much more specific about construction impacts than the text on the bottoms of pages 6.1-50 and 6.1-51. In these paragraphs the document preparer has copied and pasted exactly the same text to describe construction impacts of South Delta Intake Facilities and South Delta Flow Control Barriers. Because the locations of the proposed facilities are known, and because it should be possible to describe the nature of the construction that will be required to construct the facilities, it should be possible to describe impacts in some detail and provide the reader with more information on the potential significance of impacts. Impacts such as disturbance of existing biological communities and mobilization of sediment may or may not be significant depending on what aquatic resources are being disturbed, what time of year the disturbance would take place, the ability of the affected species to recover from disturbance, and the approximate magnitude of the amount of area being disturbed. The impact analysis should identify how much habitat of which type will be disturbed by the proposed construction and the nature of the aquatic resources that will be affected. Even though this is a

Programmatic EIS/EIR, and facility design and exact construction details are not yet known, enough information is available to give readers a better sense of the possible magnitude of the impacts. The generic construction impacts paragraph copied and pasted throughout this section identifies input of contaminants as a potentially significant impact of construction. Is there any reason to believe that contaminated sediments may be present in any of the areas where construction would occur for the Preferred Program Alternative? If so then this concern should be mentioned specifically in the text for each construction area, and the contaminants of concern in the construction area identified. If not, then the concern about contaminant input must be that toxic materials such as fuels associated with construction equipment might leak or spill into the aquatic environment. If the latter is the case, the text should clearly explain that leaks or spills from construction equipment could contaminate the aquatic environment.

In the discussion of impacts of the Hood to Mokelumne River Channel on page 6.1-52, the text states that Hood diversion would increase juvenile salmon movement from the Sacramento River into the Mokelumne River Channel, reducing their survival. Why is that and what is meant by "reducing their survival"? Is the trip into the Mokelumne River Channel a dead end in which all juvenile salmon die, or is it just that the habitat is less good in the Mokelumne River? What sort of magnitude of reduced survival is anticipated?

On page 6.1-53, the discussion of channel enlargement of the Mokelumne River needs more detail. The text says that construction of setback levees to enlarge the Mokelumne River Channel could increase productivity and provide habitat. Again, more details are needed. In what ways would levee setback increase productivity? Some of the discussion of Productivity on pages 6.1-20 and 6.1-21 in *Section 6.1.4 Assessment Methods* could be moved here to explain that setting back levees would help to re-establish natural stream processes which would increase productivity by providing more vegetation, more nutrients, etc. About how much additional aquatic habitat would setting back levees to enlarge the Mokelumne River Channel provide? Similarly, the discussion of the potential benefits and adverse impacts of enlarging the Mokelumne River Channel needs more detail. About how much deeper would the Mokelumne River Channel need to be and in what ways would an increase in depth of this approximate magnitude change the value of the habitat for aquatic communities and target species? Would biological diversity be likely to be affected? Which target species would be negatively impacted by a deeper channel? Would any target species benefit? How much aquatic habitat in the Mokelumne River Channel would be permanently affected by channel deepening? It seems that sufficient information is available to make approximate quantitative estimates for specific proposed facilities. For example, *Table 4-3 Estimates of Land Area Affected by Storage and Conveyance* (in acres) on page 4-13 in *Chapter 4 Guide to Impact Analyses and Description of Land Use Assumptions* provides estimates of the amount of acres of land area in the Delta Region that would be affected by conveyance modifications for each alternative.

The discussion on page 6.1-53 on the effects of the Preferred Program Alternative on the Bay Region states that changes in Delta conveyance could increase average annual

exports and potentially reduce Delta outflow by 200-500 thousand acre-feet relative to No Action Alternative conditions. The paragraph then states that the simulated reduction in outflow is relatively small and adverse impacts are less than significant. The text needs to substantiate why a reduction in outflow of this amount would not have significant effects on Delta species. Presumably such a small reduction in outflow would not affect X2. If that is the case, it needs to be specifically stated in the text along with the reason the author can reach that conclusion. Presumably the amount of reduction of Delta outflow was based on the hydrodynamic modeling presented in *Section 5.2 Bay-Delta Hydrodynamics and Riverine Hydraulics*. How much uncertainty is there in this modeling? Would the determination of the level of flow and subsequent significance of impacts be different depending on modeling uncertainty?

The discussion in Sections 6.1.8.2, 6.1.8.3, and 6.1.8.4 comparing the impacts of the alternatives is the weakest section of the impacts analysis. The reader must be given enough information to distinguish amongst alternatives and few details are provided here. In Section 6.1.8.2 Alternative 1, the text states that the impacts associated with a change in Delta channel capacity, modified south Delta intake facilities, and south Delta flow control barriers would be similar to those described for the preferred program Alternative, except that unavoidable potentially significant adverse impacts could occur. What specifically are the unavoidable potentially significant adverse impacts? The discussion can refer back to the analysis in *Section 6.1.8.1 Preferred Program Alternative*, but the specific unavoidable impacts of Alternative 1 need to be identified in Section 6.1.8.2. If significant impacts are avoidable for the Preferred Program Alternative, is it not likely that mitigations would be available that would reduce potentially significant impacts from Alternative 1 to less than significant? If the reason that there are no unavoidable significant impacts for the Preferred Program Alternative is that facilities will not be built until they can be demonstrated to have no significant adverse impacts, then isn't it possible that the Preferred Program Alternative could end up being the same as the No Action Alternative for the Conveyance program? Any measures, other than avoidance by not constructing a facility, incorporated into the Preferred Program Alternative should generally be available as potential mitigation measures for the other alternatives.

Much more detail is needed for the discussion of impacts of Alternative 2 in Section 6.1.8.3 on page 6.1-54. This section needs to describe in detail the impacts of a 10,000 cfs diversion facility at Hood. What are the specific differences between the impacts of a 10,000 cfs diversion facility as is proposed for Alternative 1 and a 4,000 cfs pilot diversion facility such as might be implemented under the Preferred Program Alternative? All of the impacts of the 10,000 cfs diversion facility need to be mentioned in this section although this section need not repeat the entire analysis that was presented in Section 6.1.8.1.

As was true of *Section 6.1.8.3 Alternative 2*, much more detail is needed in *Section 6.1.8.4 Alternative 3*. This discussion is particularly confusing because both significant adverse and beneficial impacts are mentioned, and it is unclear if the implementation of Alternative 3 would be better for fisheries and aquatic resources than Alternatives 1 and 2. Would Alternative 3 potentially have greater benefits to aquatic resources than

the Preferred Program Alternative even though it has greater potential for significant adverse impacts? The discussion on page 6.1-55 states that changes in Delta flow conditions could lead to potentially significant unavoidable adverse impacts although substantial beneficial impacts attributable to improved flow conditions in the central and south Delta are also probable. This section needs to describe each of the potentially significant adverse impacts that could occur from changes in Delta flow, list the target species that would be affected, and provide some sort of estimate of the approximate magnitude of adverse impacts. Similarly, the section should describe the potential beneficial impacts from improved flow in the central and south Delta, list the target species that would benefit, and provide an estimate of the potential magnitude of beneficial impacts.

On page 6.1-55, the text states that overland irrigation supplies would be provided to the south Delta and impacts associated with the overland irrigation supply would need to be evaluated. What might those impacts be? Section 6.1.8.4 needs to identify the impacts to fisheries and aquatic resources that might occur from overland irrigation supply and needs to specify which aquatic species might be affected.

As was discussed under *Section 6.1.8.2 Alternative 1*, why is it not possible that some of the measures used to avoid significant impacts under the Preferred Program Alternative be incorporated as mitigation measures for Alternatives 2 and 3? Measures such as research and design to avoid impacts seem like reasonable mitigations. Obviously any measures that would avoid impacts by constructing no conveyance facilities could not be incorporated into Alternatives 1, 2, and 3 but if no facilities are the only way to avoid impacts the Preferred Program Alternative is substantially the No Action Alternative for conveyance.

6.1.9 Program Alternatives Compared to Existing Conditions

This same issue discussed for Section 6.1.8 about significant unavoidable impacts appears again in *Section 6.1.9 Program Alternatives Compared to Existing Conditions* on page 6.1-57. The first paragraph on the top of page 6.1-57 states that implementation of strategies to avoid potentially significant adverse impacts on fish populations would be incorporated under the Preferred Program Alternative. Unless the only strategy is not constructing the facility, couldn't some of those facilities be implemented as mitigation measures to reduce potentially significant impacts under Alternatives 1, 2, and 3? In *Section 6.1.1 Summary* on page 6.1-4 a variety of mitigation strategies are listed to reduce potentially significant impacts of the Preferred Program Alternative to less than significant. Why couldn't those same strategies be applied to Alternatives 1, 2, and 3?

6.1.10 Additional Impact Analysis

The Cumulative Impacts analysis in *Section 6.1.10 Additional Impact Analysis* on pages 6.1-58 and 6.1-59 is totally inadequate. In fact, this section has no analysis at all. The

impacts of the specific projects listed in *Section A.5 Actions that may Contribute to Cumulative Impacts* need to be presented and discussed in Section 6.1.10. In fact, most of these projects are projects designed to benefit aquatic resources. The location of these cumulative projects should be shown on a map, and the target species that could be affected by their actions identified. The approximate area of aquatic habitat to benefit from habitat restoration of the restoration projects such as the Central Valley Improvement Project Act and the Montezuma Wetlands Project needs to be estimated for each of the project regions and compared to habitat creation and restoration from the CALFED Ecosystem Restoration Program Plan. *Table 4.2 Estimate of Land Area affected by the Ecosystem Restoration Program* (in acres), on page 4-10 of Section 4 Guide to Impact Analyses and description of Land Use Assumptions, includes an estimate of various types of aquatic habitat in each region that would benefit from the Ecosystem Restoration Program Plan. A similar analysis needs to be done for adverse impacts to quantify the potential adverse impacts of CALFED conveyance alternatives compared to projects such as the East Bay Municipal Utility District (EBMUD) Supplemental Water Supply project.

The discussion of Short and Long-Term Relationships on pages 6.1-59 and 6.1-60 states that the intensity of impacts increases from Alternative 1 through Alternative 3 but that increase in intensity of adverse impacts was not demonstrated in Sections 6.1.8.2, 6.1.8.3, and 6.1.8.4. If the impact analyses were more quantitative as suggested by specific comments on those sections, perhaps this increase in intensity of impacts could be demonstrated.

6.1.11 Mitigation Strategies

Each mitigation measure identified on page 6.1-61 needs to be tied to a specific potentially significant impact as was done for the Preferred Program Plan on pages 6.1-4 and 6.1-5 in *Section 6.1-1 Summary*. This section also needs to identify whether the proposed mitigation measure can reduce the impact to non-significant or if a significant impact is unavoidable. This section should also identify which impacts and mitigation measures apply to which alternative.

Section 6.1.12 *Potentially Significant Unavoidable Impacts* is one of the more clearly written sections although the supporting text in the previous sections has not sufficiently demonstrated why these impacts would be significant and unavoidable. For each significant unavoidable impact listed, the alternatives that would include this impact should be identified.

6.2 VEGETATION AND WILDLIFE

GENERAL COMMENTS

This section is based on information from the Draft CALFED Technical Reports for Vegetation and Wildlife: Affected Environment with Supplements, and Environmental Consequences (March 1998). These Technical Reports are excellent and do an admirable job of covering a complicated project with a huge geographic scope that includes many diverse resources at a level of detail that is not too detailed as to be overwhelming, or too simple as to be uninformative.

If Section 6.2 of the PEIS/EIR were a concise summary of these reports, it would be an effective and efficient task. Section 6.2 as it stands does not do this. The following comments are meant to assist the preparer with moving in that direction. Most of the general comments require major changes to the section, changes that are critical to the section being well organized, clear, and accurate with the information necessary to understand the resources.

Another option would be to include the Technical Reports for Vegetation and Wildlife as an appendix to the PEIS/EIR, particularly the Affected Environment with Supplements. The PEIS/EIR obviously already contains an extreme number of appendices, but this would limit the information necessary in Section 6.2. If this report were added as an appendix, many changes would still be needed to Section 6.2, but the section could be shortened considerably by referring to the appendix.

The following comments are presented for each subsection, and each page in the section. Usually a "General Comments" summary is given, then specific comments on the text per paragraph. Paragraphs were counted from the first full paragraph on the page.

The section should have clearly defined resources in the Affected Environment/Existing Conditions section and clear significance criteria, then impacts that clearly match one or more of the significance criteria (if they are called significant impacts), and mitigation measures that clearly can be matched up with one or more of the significant impacts. None of these elements are present in Section 6.2.

6.2.1 Summary

Page 6.2-1

Paragraph 1. This paragraph belongs in Chapter 1 under Purpose and Need. A more appropriate introduction would generally discuss habitat types and sensitive resources including plants, animals, and habitats.

Paragraph 2. There are several terms in this paragraph that most people would not understand, including "loading of organic and inorganic constituents" and "bioaccumulation of those compounds in the food web." Wording needs to be simpler or these terms defined.

In the last sentence, the Preferred Program Alternative is called the "Program." These are two distinct ideas that need to be kept clearly separate. The "Program" is the overall CALFED Bay-Delta Program as defined in Section 1, while the "Preferred Program Alternative" is simply one of the options to meet the Program goals. This problem is found periodically throughout Section 6.2.

Page 6.2-2

Paragraph 1. The same issue with the use of the word "Program" applies here. It is unclear whether what is meant here is the Program or the Preferred Program Alternative.

In the last sentence it states "Channel dredging would cause" Because we do not know what would happen, this should be changed to "could cause" or "may cause." This problem occurs frequently throughout Section 6.2.

Page 6.2-3

Two general observations about the impacts:

1. Organization is lacking in the impact section. Either the impacts should be organized by what is causing the impact (construction, loss of vegetation, inundation, etc.) or by what type of resource is being affected (general vegetation or wildlife, special-status plant or animals, protected habitats, etc.). By mixing these, impacts are confusing and sometimes repeated. This problem is found periodically throughout Section 6.2.
2. The impact table needs to indicate whether these are direct or indirect impacts as required under CEQA.

On this page, terminology is not consistent. When speaking of a vegetation community, use consistent terminology for the reader. Choose either "riparian communities," or "riparian habitats." This problem is found periodically throughout Section 6.2.

Mitigation Strategies. Because this is a programmatic document, the mitigation measures should discuss the need for further action if program activities may disturb particular special-status species or protected habitats. This problem occurs periodically throughout Section 6.2.

In Section 6.2.11 Mitigation Strategies, there are 29 measures listed, while the summary lists 14.

Many of the mitigation strategies appear to be similar, if not the same or subsets of each other. No. 9 discusses enhancing or restoring habitat areas in watersheds (in general). No. 3 discusses restoring or enhancing wetland and riparian habitats offsite and seems to be a subset of No. 9, as does No. 6.

Similarly, No. 5 discusses phasing the Ecosystem Restoration Program in general, while No. 7 and No. 8 discuss phasing the Ecosystem Restoration Program for specific habitats and seems to be subsets of No. 5.

No. 5 could be reworded to make it easier to understand for the reader.

No. 14 discusses implementing best management practices (which should be spelled out for the reader, not just BMP). Aren't at least some of the mitigations there to determine best management practices? If there are other best management practices needed, they should be detailed as mitigation measures.

6.2.2 Areas of Controversy

Page 6.2-4

Paragraph 1. Instead of the last sentence in the first paragraph that offers a disclaimer regarding the programmatic nature of this document, perhaps this should be a subheading under this section, such as "Unavailability of Specific Analysis." This section could explain that due to the programmatic nature of the document, specific analysis is not practical and will be presented in future project-specific environmental analysis.

Paragraph 4. In the section "Mitigation vs. Ecosystem Restoration Program Implementation," there could be added a discussion also of the fact that there are also mitigations that will be required, (which are presented in the mitigation section) for the short-term impacts caused by the implementation of the Ecosystem Restoration Program. As presented, it sounds like there are no impacts expected or mitigation required resulting from the implementation of the Ecosystem Restoration Program.

Paragraph 5. The second sentence reads that the "reduction of fuel loads and possible impacts on special-status species may conflict with the (ESA)." This is not precise and the sentence needs to be reworded. Impacts on special status species may conflict with the ESA, but not the reduction of fuel loads.

In this section and on the next page, remove the reference to "commentors" since this is technically the first time this draft has gone public for comments. Use language like in paragraph 4, "confusion exists."

Page 6.2-5

Paragraph 1. Is this an "area of controversy" or is it a potential impact? There does not seem to be controversy of the increase of salinity from the discussion presented here, just controversy over how it could affect the resources or how it could be mitigated.

Paragraph 3. Until the last sentence, it is unclear what this discussion has to do with biological resources. Bring the last sentence to the beginning and then support the statement. Indicate that the discussion of impacts is about *potential* impacts, not certain-to-occur impacts.

Paragraph 4. Indicate that additional environmental documentation will be completed when specific sites and projects have been identified.

6.2.3 Affected Environment/Existing Conditions

When the Technical Reports of March 1998 are discussed here, it refers to the Affected Environment, Vegetation and Wildlife Report.

GENERAL COMMENTS

In general, the Historical Perspective sections seem more like a Purpose and Need for the program, or, at least for the Ecosystem Restoration Program. Although the information is useful, it might best serve the reader if moved to Section 1, summarized, and coupled with maps illustrating the historical loss and degradation of habitat. Section (6.2) could then support a more comprehensive discussion of the Affected Environment and Impacts.

This entire section is vague and contains very little useful information on which to base an impact assessment. The information chosen to include in the section is extremely general, even for a project of this size and scope. More detailed (and not necessarily longer) information is available in the Technical Report and would greatly increase the value of this section to the reader.

The Technical Report contains abundant historic perspective information, which is appropriate for a stand-alone report on the vegetation and wildlife resources. In the PEIS/EIR, this information may be better placed in the Purpose and Need (Section 1.2). Additionally, the Technical Reports contain good data about the historical loss and degradation of habitat that could strengthen the Purpose and Need section. Table 1 and Figures 1 and 2 along with associated text would be particularly appropriate.

Similar information on historic perspective is often repeated from subsection to subsection. All of this could be moved to Purpose and Need. The Affected Environment/Existing Conditions section is meant to present resources as they exist currently, not historically.

No citations are included to inform the reader where the information was found. This information is found in the Technical Report. Because the report is not an appendix to the PEIS/EIR, these references need to be in the section. The author cannot possibly have written this without referencing many documents including vegetation community information, field guides, historical information about the regions, sensitive species lists, and so forth. What terminology is used for community discussions? All of this information is available in the Technical Report, but is not in the PEIS/EIR. As it stands, the section appears to have been written without referencing any technical documents or experts, which is not the case.

When you make a statement like "Development, agriculture, and water diversions were not as extensive as those in the Delta Region (page 6.2-11, paragraph 3)," it needs to be supported by some kind of statistics. Many such unsubstantiated observations are made throughout section 6.2.3.

The affected environment sections lack consistency in presenting data upon which to base the impact analysis. Only occasionally is there any quantification of the resources present. In order to adequately address project impacts, it's necessary to describe the type and amount of the various plant communities/wildlife habitat present. Because of the size and scope of the program, it may not be necessary to split things down to series, except for the most sensitive or rare communities. However, acreages should at least be included for broad classifications (e.g., riparian scrub). Most importantly, the sections should include maps illustrating the distribution of plant communities, and wildlife and sensitive species habitat.

Statistics to support discussion are lacking throughout the section, but are available in the Technical Report. Table 2 on page 12 of the Technical Report presents approximate acreages of broad habitat classifications across the four main regions of the Program. Figures 3, 5, and 8 show the general distribution of plant communities. Figures 4, 7, and 9 show the significant natural areas within the region. All of these figures are incredibly useful and show much more than words could describe in the same amount of space. Some of them might even be reduced to include two per page if space is an issue. Nonetheless, they all should be in the PEIS/EIR.

Lack of organization makes the entire section confusing. The preparers could add a paragraph before section 6.2.3.1 to present the organization of the section. For example:

The affected environment and existing conditions for vegetation and wildlife resources are discussed by regions within the study area (as presented in the Description of the Study Area, Section 1.3.2). Within each region, resources have been organized into three categories: natural

and agricultural communities and associated wildlife, special status species, and waterfowl and shorebirds. Natural and agricultural communities describe the upland plant communities found within the study area, and wildlife that inhabits each community. Special status species discussed those species listed by resource agencies such as the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and California Native Plant Society (CNPS) as endangered, threatened, or otherwise protected. Waterfowl and shorebirds presents a discussion of those upland resources with the greatest potential to be affected by the Program.

There is little discussion of the makeup of the various plant communities and wildlife habitats in the various project regions. In the cases where species are mentioned, there is no indication of why they were chosen to represent particular habitats. For many regions and habitats, no examples are presented. Because of the size of the project and the diversity of communities affected, the use of representative species for impact analysis would be appropriate (as in Table 6.1.1-1). However the choice of species should be truly representative of the habitat being assessed and the approach would need to be applied consistently. It would be extremely helpful to organize the discussion to present the plant communities/wildlife habitats present (even if it has to be at a fairly broad scale) and then present representative examples of the types of wildlife species which utilize them. Although it could be argued that waterfowl and shorebirds would be most affected by the program (mostly in beneficial ways), the discussion should not virtually ignore other wildlife groups as it currently does.

For the reader to understand impact analysis, they must be clearly presented with the resources that may be affected, either beneficially or adversely.

The breakdown of sections in the PEIS/EIR is not clearly defined which has resulted in important resources being virtually ignored. The purpose of the "natural and agricultural communities" section as presented in Section 6.2.3 is unclear. Most EIS/EIR documents use a standard set of resources, although they may be presented in different combinations: General Vegetation, General Wildlife, Sensitive Plant Species, Sensitive Animal Species, and Sensitive Habitats. The Technical Report does just that with the addition of the section for waterfowl and shorebirds, which is appropriate for this project as these are the resources with the greatest potential to be affected.

It is difficult to detect any regular pattern in this section. The purpose of standard organization is that the general vegetation and wildlife sections should provide the reader with a basis for understanding the natural resources of the region, as the section called "natural and agricultural communities and associated wildlife" does in the Technical Report. It appears that this section was condensed and called "natural and agricultural communities" in the PEIS/EIR. The purpose of the section seems to have been lost in the translation and needs to be clearly defined in the PEIS/EIR. This section should present communities according to some accepted classification system (which is referenced in the Technical Report), and describe each community and its associated wildlife, giving examples of plant and wildlife species representative of that

community or habitat. Here is an example:

Vernal pools are low lying communities dominated by annual grasses. These communities contain water in the winter that may evaporate in the spring. Plants found in vernal pool communities in the study area include fireweeds, Downingia, button celery, and goldfields. Vernal pools support a variety of invertebrates such as tadpole shrimp and fairy shrimp, and amphibians (red-legged frog and tiger salamander).

It may be appropriate to refer scientific names of species to an appendix and remove them from the body of the section, as the Technical Report does.

On a related note, although vernal pools are found within upland habitats, it may be more appropriate for this community to be discussed under Section 6.1 Fisheries and Aquatic Ecosystems.

Subsections for special-status plant and animal species inform the reader about biological resources that are protected by federal, state, and local laws, and those of concern to other organizations such as the CNPS. In the Technical Report, there are very general sections called "Special-Status Plants" and "Special Status Wildlife." Both are very important sections that were all but lost in the PEIS/EIR when a very selective amount was taken from the report. These sections within the Technical Report are not long, but are critical to the understanding of the local resources and should not be overlooked. Although the Multi-Species Conservation Strategy (Conservation Strategy) presents information regarding sensitive species in the study area and potential alternatives for their conservation, it does not present the information in a manner consistent with NEPA and CEQA analysis, which is required in the PEIS/EIR.

Subsections on sensitive habitats inform the reader of habitats that are protected by federal, state, or local laws such as vernal pools or critical habitat. No such information exists, either in the Technical Report, or the PEIS/EIR. This information is important because, if nothing else, there are legal implications to affecting these habitats.

Subsections on significant natural areas (SNAs) discuss those areas that the CDFG has defined as SNAs because either they support rare species or communities, an assemblage of three rare elements, a habitat in extremely pristine condition, or is the center of high diversity for biological resources. Knowing the locations of these areas is important to the understanding of the local resources and completely absent from the PEIS/EIR although succinctly shown in the Technical Report on Figures 4, 7, and 9.

The importance of the project region to waterfowl and shorebirds is obvious and having separate sections for the discussion of these species is helpful. The location of these discussions within the organization of the section is a little confusing. Perhaps the sections should be a clear subsection under special-status species.

"Waterfowl and Shorebirds" is not a typical section but is relevant to this project and appropriate to the PEIS/EIR. However, it should not have been retained to the loss of

other resources that are also important to the reader's understanding of the biology of the region. This section does not discuss only special-status species, and should probably be placed after, or as a subsection of, the "natural and agricultural communities and associated wildlife."

Perhaps it would be easier and less confusing to remove scientific names for plant and animal species throughout the section. This requires, as in the Technical Report, that lists of species with their common and scientific names be available in an appendix or elsewhere, preferably alphabetized by common name so the reader can easily access the information.

Special-status species must be defined. It is not stated whether only state and federally listed species were considered or if the analysis includes species down to CNPS List 4. It is not clear why the few species which are named and their ecology discussed have been chosen for special treatment. In other cases there is simply a number of sensitive species potentially present without a list of what they are. In still other cases, a few species are named, but there is no indication of whether the list is comprehensive or is just presenting examples.

It is strongly recommended that a separate subsection for sensitive species be included. The section should include tables for each project region showing the legal status of each species and the habitats upon which they are dependent. Maps illustrating the distribution of sensitive species and sensitive habitats would also be helpful. Merely stating that a certain number of sensitive species occur or have the potential to occur in a region, is of limited benefit. Some species that could occur may be unlikely to be affected by the program at all, while others may suffer significant losses. Which species could occur and why is critical to the understanding of the program's impacts. For example, program impacts to resident versus migrant or transient species could differ greatly. Clear identification of the sensitive species present and, at least a brief discussion of their ecology (even if only done in guilds associated with a particular habitat) must be included to aid the impact evaluation.

This information is not available in the Technical Report, but should be included in the PEIS/EIR, if only as a table that lists each species, it's legal status, the habitats in which it is found, and the region in which it is found. These tables could be made to look somewhat like the tables in the Supplement of the Technical Report. These tables are

called "Habitat Guild and Species Summary" (pages S-50 through S-60) and list species by habitat type and region.

6.2.3.1 Delta Region

Page 6.2-6

The subsection on "Natural and Agricultural Communities" is far too general to be useful, particularly when better information exists in the Technical Report.

Paragraph 1. This needs a citation.

Paragraph 2. This needs a citation.

Paragraph 5. In line 4, the text states that "Vegetable crops are the most abundant crops in the region." If they are most abundant, they should be discussed first.

Page 6.2-7

Why are wetlands and open water habitats discussed in detail while other are all but ignored? They are the most relevant to the project, but not to the extent that other areas be ignored.

Consistency is a problem throughout Section 6.2.3. Sometimes details like scientific names are present. Scientific names are repeated from paragraph to paragraph. Distinctions are not clear between permanent and seasonal marsh, and tidal and non-tidal marsh.

Paragraph 3. The second half of the paragraph, beginning in line 5, belongs under special-status species.

Page 6.2-8

Paragraphs 1-2. Lines 3-4 of paragraph 1 state that "most of the special status species occur in grassland and vernal pools." First, it should be "grasslands" or "grassland communities" and maybe "nonnative grasslands." Second, it is in apparent contradiction with paragraph 2 that states the "most of the special-status wildlife species are associated with fresh-water emergent wetlands, marshes, open water, and agricultural lands." Which is it? Or does the first part refer only to plants?

In paragraph 1, lines 4-5, the sentence should be removed. Obviously remaining plants are in other habitats.

Paragraph 3. In what habitat does the valley elderberry longhorn beetle live? This text makes it sound as if it inhabits vernal pools.

Paragraph 4. This disclaimer should be made up front and just once (as opposed to throughout Section 6.2.3), maybe even in an introduction to the section. Even though there is abundant information on special-status species in the Conservation Strategy, that does not preclude presenting that information here in a concise manner for the reader. Most readers will find the PEIS/EIR cumbersome enough without referencing the extra volumes such as the Conservation Strategy.

Paragraph 5. The first sentence attributes declines to development and agriculture, while the next sentence attributes declines to hunting and reclamation of tidal marshes. Reword the paragraph to show that the declines from development and agriculture have happened subsequent to the declines associated with hunting and reclamation.

Paragraph 6. This needs a citation.

Paragraph 7. This is a mix of special-status and common species, without reference to the fact that some of these species are listed. This confusion could be resolved by keeping discussion of special-status species in the appropriate subsection.

Paragraph 8. In lines 1-2, the text discusses 6 species that nest in the region, but does not list them. This could be useful information for assessing impacts.

6.2.3.2 Bay Region

Page 6.2-9

The initial part of Section 6.2.3.2 could be removed since this information is present in the first section of the PEIS/EIR.

Paragraph 1. In line 2, what "issues associated with the Program" does the text refer to? Biological resource issues?

Paragraph 5. In line 2, what are "productive wetlands"?

Paragraphs 5-6. Again there is an apparent conflict in the cause of the reduction of habitats. The last sentence of paragraph 5 reads "agricultural development and industry" while the first sentence of paragraph 6 indicates "removal of tidal influence." By indicating the relationship, the text would be much clearer.

Paragraphs 5-7. These are repetitive and could be combined into one discussion.

Page 6.2-10

Paragraph 1. Inconsistencies - why do some species have scientific names and others do not?

Paragraph 5. Why are some plant species discussed and not others? Why is the status listed for Mason's lilaeopsis and not others?

Paragraph 6. Why are some species discussed and not others? Are they the only federally and state listed ones? Needs to be clearer. Haven't peregrines been known to nest in the bay area? Bay bridge and NAS Alameda?

(Continued on page 6.2-11) Why is the listing given for California black rail and not other species?

Page 6.2-11

Paragraph 2. This needs a citation. Both these regions have lost an extreme percentage of their wetlands. Without referenced statistics, this may be difficult to give credence to.

Paragraph 3. Might want to define Pacific Flyway for readers.

6.2.3.3 Sacramento River Region

Paragraph 5. In line 1, the text indicates the "drainage" of the Sacramento River. Is it the drainage or the watershed?

In line 5, the text refers to "very productive and extensive riparian areas." Please define "productive."

Page 6.2-12

Paragraph 2. In line three, aren't dams, agriculture, fuel, and construction all subsets of development? What are "construction needs"?

Paragraph 3. In line 4, the text "former communities" could be changed to "former natural communities" in order to avoid confusion with the residential areas addressed in the same sentence.

Paragraph 4. In line 2, the wording should be changed to remove the word "sustained" because the statement that development and logging have been "sustainable" in the region is likely debatable.

Paragraphs 5-6. The two paragraphs are somewhat repetitive. Define montane hardwood in the last line of paragraph 5.

In line 7, what were the "unfavorable conditions"? This phrase is extremely vague and tells the reader nothing. In line 8, when did population start to recover? This also needs a citation.

Page 6.2-13

Paragraph 1. This is the first reference to the "Sacramento Valley." What is the extent of this area and is it the same as the Sacramento River Region?

Paragraphs 1-2. What birds does this section refer to? This text does not even provide representative species.

6.2.3.4 San Joaquin River Region

Paragraph 3. This paragraph contains the word "region" at least 13 times and should be reworded.

Paragraph 4. This is the first time in the entire section that acreage is given for a community or habitat.

Page 6.2-14

Paragraphs 2-3. There is inconsistent terminology for the community "grassland" or "grasslands." This occurs throughout the section.

Paragraph 5. This is mostly unsubstantiated information. In line 7, the text discusses the "initial" recovery of waterfowl and shorebirds, without dates or citation.

6.2.3.5 Other SWP and CVP Service Areas

GENERAL COMMENTS

Section (6.2.1.5), SWP and CVP Service Areas Outside the Central Valley. This section is so brief that it provides little useful information upon which to base an impact evaluation.

Beyond being brief, the information provided cannot support impact analyses. This section, like the rest of Section 6.2.3 contains no data, and no citations for the position taken. Although no information is given in the Technical Report to assist with this section, the text could discuss the need for future environmental evaluation.

Page 6.2-15

Paragraph 3. Why were the species listed in the last paragraph chosen? Are they the only ones officially listed? Somehow representative?

6.2.4 Assessment Methods

GENERAL COMMENTS

1. This section has been condensed from the Technical Report, Environmental Consequences, Vegetation & Wildlife (March 1998); hereafter called the "Technical Report." This section is basically good, but suffers greatly from the lack of information preceding it in the Affected Environment/Existing Conditions Section.
2. Perhaps the section title should read "Impact Assessment Methods" instead of "Assessment Methods." Assessment methods are used (or should be) for all types of assessments, including the Affected Environment/Existing Conditions section.

Page 6.2-15

Paragraph 5. In line 7, the text talks about rare natural communities, which are not discussed in the Affected Environment/Existing Conditions section. The Technical Report discusses "significant natural communities."

In line 8, the text refers to "living" areas for wildlife, a term not commonly used for biological resources.

(Page 6.2-16) The last sentence refers to indirect impacts and the inability to assess these impacts at the programmatic level. Yet many of the impacts discussed in the following sections are indirect. This will be discussed further under Section 6.2.6.

Page 6.2-16

Paragraph 1. First, of the seven bulleted items presented here, not one was discussed in the Affected Environment/Existing Conditions section. How can the reader be expected to understand this without access to the Technical Report?

In lines 8-9, the text reads ". . . geographic extent, distribution, quality, and spatial configuration." How does geographic extent differ from spatial configuration?

Page 6.2-17

Paragraphs 1-2. Combine the information from these paragraphs to make one effective one. Delete the first sentence and (paragraph 2) better define how this information was used. What are "proposed alternative features"?

Paragraph 3. In line 1, RAREFIND should be changed to Natural Diversity Data Base (NDDDB) to be consistent, since they are part of the same program, assuming the NDDDB was used to find this information.

In line 5, the Technical Report needs to be made available to the reader, should the preparer continue to refer to it.

Paragraph 4. This should be the beginning of the special-status species discussion, not the end.

Paragraph 5. Neither "rare natural communities" nor "significant natural areas" are discussed in the Affected Environment/Existing Conditions.

6.2.5 Significance Criteria

GENERAL COMMENTS

1. It is vital to the assessment process that criteria for establishing significance be clear and comprehensible, and that these criteria be applied in a consistent manner during the impact assessment to determine the significance of an impact. This may seem apparent, but is frequently not practiced, as seems to be the case here.
2. Each time an action is determined to significantly impact the resource during the impact evaluation, it needs to be made clear that this action will correspond with one or more of the significance criteria. This is also not at all clear in the environmental consequences section of the PEIS/EIR.

Page 6.2.17

Paragraph 6 (first paragraph of Section 6.2.5). In the first line, change "would" to "could" or "may" or some other less definite phrasing, since it is not certain what *would* happen.

This whole paragraph is nebulous and not supported by the subsequent bulleted criteria. The second sentence regarding thresholds of significance makes no sense. What kind of "flexible standards"? What differences in the environmental setting does this refer to? Examples should be provided to show how such "flexible standards" would be established for project level environmental documentation.

The next sentence refers to thresholds being qualitative or quantitative, but that those criteria that are used are qualitative. However, many of the criteria used are quantitative, and there are quantitative statements made within the environmental consequences section. The section might be clearer if this discussion were removed.

Quantitative measurements are those that discuss amount of a community or habitat; or numbers of species, populations, or individuals. It is not necessary to have actual numeric data for a measurement to be quantitative.

Qualitative measurements relate to the value of the resource, or the value of the community or habitat for specific species, populations, or individuals.

From the last sentence, not only "can and will" the thresholds be made more definitive and quantitative, they are required to be. This is the closest that Section 6.2 comes to saying that there is a need for further documentation when specific sites and projects are defined. This needs to be more clearly stated throughout the entire document, including Section 6.2.

Consistency in terminology is lacking. Either use "threshold of significance" or "significance criteria," but not both.

Bullet 1. This is a quantitative measurement and not a qualitative one.

This is an appropriate significance criterion. However, the importance of wetlands and riparian communities is not explained anywhere in the text, which may make this confusing to the lay reader.

How does this differ from the sixth bullet on the next page that presents "reduction in the area or extent of special-status communities" as a criterion? Because none of these resources have been defined in the Affected Environment/Existing Conditions section, this is vague.

Page 6.2-18

Bullet 2. What are "important wildlife areas" and "use areas" and how do they differ from habitats? This is also a quantitative, not a qualitative measurement.

Bullet 3. This is both a quantitative and qualitative measurement. Quantitative because it depends on the acreage lost, and qualitative because it assesses the value of the habitat or movement corridor.

Bullet 4. This should be reworded as presented in the Technical Report by removing the phrase "including forage from agricultural lands."

This is both a quantitative and qualitative measurement.

The word "substantial" should be added at the beginning of the sentence because small losses of foraging habitat would not be considered a significant impact.

Bullet 5. This criterion is not discussed anywhere in the impact section and should be deleted.

The word "substantial" should be added at the beginning of the sentence because a small increase would not be considered a significant impact.

Bullet 6. Add "temporary or" at the beginning of the sentence because any action, whether temporary or permanent that could result in the loss of a listed species should be considered significant.

This is a quantitative measurement.

Bullet 7. What is the difference between "area" and "extent" in this context? Wouldn't they both change if either was changed? This is the first time the phrase "special-status community" is used. What communities are these? They are not discussed in the Affected Environment/Existing Conditions section.

This is a quantitative measurement.

Bullet 8. This is both a quantitative and qualitative measurement. Changing the word "area" to "acreage" might be clearer.

6.2.6 No Action Alternative

GENERAL COMMENTS

Again, it would aid the reader to have a brief explanation of how this section is organized, to more easily follow the discussion.

The impact section should use wording like "could," "may," "is likely to," or "would likely." There are several places the text refers to actions that "would" happen, a level of certainty that is probably not possible at this level of analysis.

This section assumes a level of knowledge about other activities in the region that have not been previously discussed. This information is found in Attachment A and should at least be referenced so the reader can find it.

Should there be a mention of issues associated with seismic events? Isn't that part of the logic behind a large part of the Program being necessary? Because the No Action Alternative could result in major adverse changes in the levee system caused by seismic events?

Additionally, should there be more analysis of impacts from the expected increase of population in the study area under the No Action Alternative?

6.2.6.1 Delta Region

Page 6.2-18

Paragraph 8. In the sentence that begins in line 5, the text says, "wetland and riparian vegetation in the Delta would diminish over time as non-Program elements are implemented." How do we know there would not be improvements also to the system? In fact, three paragraphs later, the discussion states that there could be improvements that could "increase biological productivity"

What are the "non-Program elements"? Are these the projects referred to in Attachment A? Or some other projects?

In the same sentence, the "would" should be changed to "could" or some other less certain language.

Paragraph 9. In line 2, please define "land retirement." Is this the same as permanent fallowing?

In line 3, the "would" should be changed to "should" or some other less certain language.

The last sentence states that "any changes to the quantity or quality of habitat cannot be quantified at this programmatic level of analysis." Is this not exactly what needs to be assessed, and *is* assessed for the three alternatives? Attachment A provides information on impending projects in the area that should be used for this analysis. An attempt can at least be made instead of wholesale ignoring the analysis.

Paragraph 10. Define "land retirement." Has NWR been spelled out before this reference?

Page 6.2-19

Paragraph 1. Define what is meant by "productivity" in the first sentence.

Paragraph 2. The sentence in line 4 that begins with "Change in structural characteristics" should be in the assessment methods section, not here.

In line 8, quantifiable data is used for a project, along with the word "would." Is this project certain? If not, change to "could" or some other less certain language.

6.2.6.1 Bay Region

Changes in Section 6.2.6.1 could affect this section.

6.2.6.2 Sacramento River Region

Paragraph 5. The sentence in line 2 that begins with "Change in structural characteristics" should be in the assessment methods section, not here.

(Page 6.2-20) In the next sentence, are changes in levee maintenance structural changes?

Page 6.2-20

6.2.6.3 San Joaquin River Region

Paragraph 2. In line 3, define "retirement" and "drainage problem area." Also, quantifiable data is used for a project, and sound more certain than it probably is. Perhaps adding the word "approximately" before the 45,000 acres would be more appropriate.

Paragraph 3. This paragraph is somewhat bizarre as it offers a level of detail not found elsewhere in the impact discussion. Level 4 and level 2 are not discussed elsewhere in Section 6.2. Although exact quantities of water are not possibly known, why cannot impacts be assessed from the increase of "quantity and quality of habitat supported by Level 4 water supplies?"

6.2.6.4 Other SWP and CVP Service Areas

Paragraph 5. This paragraph assumes a level of knowledge about other activities in the region that have not been previously discussed. This information is found in Attachment A and should at least be referenced so the reader can find it. Why were these projects chosen and not others?

(Page 6.2-21) Does the last sentence refer to the Semitropic Groundwater Banking Project or another project? Or to groundwater banking projects in general?

6.2.7 Consequences: Program Elements Common to All Alternatives

GENERAL COMMENTS

This section has been condensed from the Technical Report, Environmental Consequences, Vegetation & Wildlife (March 1998); hereafter called the "Technical Report." This section suffers greatly from the lack of organization and lack of information preceding it in the Affected Environment/Existing Conditions Section.

In the Technical Report, the impacts are presented in clear, concise tables (Tables 1, 2, 4, 6, 8, 10, 11, 13, 14, 16, 17, 20, and 21). These tables or similar ones would be incredibly useful in the PEIS/EIR as they explain the impacts discussed in a succinct manner.

Although it is difficult to give detail in a programmatic document, there is a level of detail known for this project that is presented in the Technical Report and Conservation Strategy. There are approximate acreages that have been determined for each habitat type and alternative. These numbers could be used to add substance to the impact discussion.

In the PEIS/EIR, it is not clear how the impacts are organized. Impacts are discussed by Program actions. Within each Program action, the text is narrative and does not clearly state impacts and whether they are considered significant, direct or indirect, or long- or short-term. Within each Program action, it is not clear what resource (habitat, special-status species, or significant natural areas) is being affected. The impacts would be much easier to understand if it were clearly stated what the resource being affected is, what the impact is, whether it is considered significant, whether it is direct or indirect, and whether it is long- or short-term. Maybe one section or paragraph per impact and organized in a similar manner to the Affected Environment/Existing Conditions section (by resource), or by significance of the impact (significant and unavoidable first, significant and mitigable next, etc.).

The text often makes a statement referring to mitigation that could reduce an impact to a less-than-significant level. It needs to be clear what these mitigations are and how they specifically relate to the particular impact, since that is, of course, what the whole point is. It is not sufficient to say merely that an impact will be mitigated. It would be most appropriate to be able to clearly locate the mitigation measure(s) that could mitigate each impact or category of impacts.

In the introduction to this section, it states that further information on impacts to special-status species can be found in the Conservation Strategy. This is not sufficient. The Conservation Strategy does not assess impacts in a manner consistent with NEPA or CEQA, mainly in that it does not address significance of impacts.

Frequently, several impacts are discussed within the same paragraph. Often these have different levels of significance or are sufficiently different to separate the ideas.

6.2.7.1 Delta Region

Ecosystem Restoration Program, Page 6.2-21

Paragraph 3. (The first paragraph of Section 6.2.7.1) Is this meant to be a beneficial impact or a summary of the Program action?

Paragraph 4. In line 2, "target habitats" are not defined or presented prior to this reference (e.g., in the Affected Environment/Existing Conditions section).

In line 6, the text references "measures" to protect natural habitats. Are these parts of the Program action (the Ecosystem Restoration Program), or does this refer to mitigation measures?

Page 6.2-22

Paragraph 1. In lines 1, 2, and 5, the text refers to actions that "would" happen, terminology not appropriate for an impact discussion, as discussed previously.

Paragraph 2. This paragraph describes two different impacts, temporary and permanent affects of the Ecosystem Restoration Program. These impacts should be discussed separately.

The last sentence refers to mitigations for these impacts, but does not reference specific mitigation. It is not sufficient to say; "it will be mitigated." The PEIS/EIR must clearly define how each impact will be mitigated. At least refer to a section, page, or paragraph.

Paragraph 3. In line 6, it is very useful that approximate acreage is given for this impact. This information should be consistently given in other impacts as well.

The sentence that begins in line 8 with "The loss of agricultural lands" is very confusing, particularly the end of the sentence "less forage than is provided by the affected lands." What affected lands? Lands affected by this alternative? By the Program in general?

This paragraph never states the level of significance of the impact. It discusses reducing impacts to a less-than-significant level, which implies that the impact is significant. Mitigated by what actions and where are they discussed?

Paragraph 4. In line 6, does "enhancing the formation of methyl mercury," mean increasing the formation of methyl mercury?

In line 8, the sentence "In areas with mercury sediments, creation of wetlands should be avoided or anaerobic conditions should be prevented" is a mitigation measure, not an impact, and should be presented in the mitigation section.

In the first line on page 6.2-23, the "March 1998 Water Quality Technical Report" should not be referenced since the reader does not have access to this report.

Water Quality Program, Page 6.2-23

Paragraph 1. The phrase "reduce the loadings of organic and inorganic constituents" should be reworded since it is not a phrase that the general public will understand.

The last sentence of the paragraph is a mitigation measure, not an impact.

Paragraph 2. In line 2, the text should refer to where the reader can find the BMPs.

The word "would" is used inappropriately, substitute "should" or similar less certain language. Too much technical language is used throughout the paragraph.

Paragraph 3. The first sentence of the paragraph describes the Program action, and should be presented at the beginning of the section.

The second sentence refers to possible reduction in the amount of forage available, yet in the previous paragraph it was stated that there would be an increase in the availability of prey.

In line 7, will this impact affect only riparian habitats? Not wetlands or other habitats?

In line 8, a reduction in selenium could increase "water use efficiency," or should it be "water quality"? The sentence wording suggests that reduction in selenium loading "could result in the localized loss of wetland or riparian habitat areas." Is this accurate?

Levee System Integrity Program, Page 6.2-23

Paragraph 4. The word "would" is used inappropriately, substitute "should" or similar less certain language.

Page 6.2-24

Paragraph 1. The second sentence should be part of the Affected Environment/Existing Conditions section, not the impact section.

There is no statement about the significance of the impacts discussed in this paragraph. There is no mention of impacts to special-status species.

Paragraph 2. This paragraph describes the Program action, and should be presented at the beginning of the section. Add a reference somewhere in the section to what mitigation measures will reduce the level of the impact to less-than-significant.

Water Use Efficiency Program, Page 6.2-24

Paragraph 3. The word "would" is used inappropriately in the text and in the side bar, substitute "should", "could", or similar less certain language.

In lines 3 and 6, what does "program" refer to? The CALFED Program or the Water Use Efficiency Program?

The paragraph is about mitigation measures, not impacts. Or is it meant to be a description of the Program action?

Paragraph 4. The word "would" is used inappropriately bar, substitute "should", "could", or similar less certain language.

In the sentence that begins in line 2, perhaps "temporary" and "permanent" should be changed to "direct" and "indirect." Is the loss of wetlands and riparian areas here only temporary? Won't land grading and construction create more than temporary impacts?

In line 7, what is an "incidental habitat"? And what does it mean that they depend on "existing inefficiencies"?

The last sentence refers to the significance of the impacts. Which impacts? The temporary or permanent ones? Or both?

Paragraph 5 (continued on page 6.2-25). The first 2 sentences on page 6.2-25 are repetitive. In the last sentence, refer to where mitigations can be found.

Page 6.2-25

Water Transfer Program, Page 6.2-25

Paragraph 1. The word "would" is used inappropriately several times, substitute "should", "could", or similar less certain language. In line 2, is there no water currently going to "beneficial uses for wildlife and their habitats"?

Watershed Program, Page 6.2-25

Paragraph 2. In the last sentence, there is no information to support that improved flows benefit habitats and associated species. Won't there be some amount of acreage that is lost because of improved flows? This section seems incomplete. At least substantiate the statement made, or reference some data that backs up this statement.

Storage, Page 6.2-25

Paragraph 3. The word "would" is used inappropriately, substitute "should", "could", or similar less certain language. In line 4, the text discusses the creation of seasonal wetland and mudflat habitats during drawdown periods, but couldn't these same habitats be reduced by the creation of the storage facility? If this action could create 15,000 acres of open-water habitat, what is that displacing?

The first 2 sentences on page 6.2-26 are repetitive (starting on page 6.2-25). The reference in the last sentence to mitigation should indicate where the reader could look for these mitigation measures.

Page 6.2-26

Paragraph 1. The word "would" is used inappropriately, substitute "should", "could", or similar less certain language.

6.2.7.2 Bay Region

Ecosystem Restoration Program, Page 6.2-26

Paragraph 2. The word "would" is used inappropriately in the side bar, substitute "should", "could", or similar less certain language.

In line 4, there is wording that is inconsistent with discussions earlier and in the Affected Environment/Existing Conditions section, "natural plant community types." Choose one phrase and use it consistently to avoid confusion for the reader.

Paragraph 3. The word "would" is used inappropriately, substitute "should", "could", or similar less certain language.

The last sentence should be at the beginning of the section.

Too many ideas in the same paragraph (both beneficial and adverse impacts), without an assessment of significance.

Levee System Integrity Program, Page 6.2-27

Paragraph 2. Add "and indirectly" after "directly."

Water Use Efficiency and water Transfer Programs, Page 6.2-27

Paragraph 4. The first 2 sentences and the last sentence could provide a good introduction if placed in the Delta Region discussion. There is overuse of the word "potential" in this section. All impacts discussed in the PEIS/EIR are *potential* since the project has not happened yet.

Watershed Program, Page 6.2-27

Paragraph 5. Should the paragraph refer to a section not yet read? Would it be simpler to outline the impacts here and refer back to them in the San Joaquin and Sacramento Rivers sections?

6.2.7.3 Sacramento River and San Joaquin River Regions

GENERAL COMMENTS

This section contains some good general discussion about the Program elements that could be more useful in the first section, the Delta Region.

Why were these two regions combined? Because the impacts could be similar? If that is the case, there should be some explanation at the beginning of the text for this subsection.

Ecosystem Restoration Program, Page 6.2-28

Paragraph 2. Some of the wording in this paragraph is too technical for the general public, e.g., the text in line 5, "sediment detention and retention capacity of important hydrologic basins."

The first half of the paragraph could be moved to the Delta section as explanation. Impact discussion begins in line 8. There is no determination of significance for this impact. The word "would" is used inappropriately in the text and in the side bar, substitute "should", "could", or similar less certain language.

At the end of the paragraph, there is a reference to "other associated floodplain habitats," not discussed in the Affected Environment/Existing Conditions section.

Paragraph 3. This paragraph discusses the increase in open-water and wetland communities, but these habitats will displace others. What will be displaced and what are the effects of that displacement? Could they be significant?

In line 6, "would potentially" is poor grammar, substitute "should", "could", or similar language.

Paragraph 4. The word "would" is used inappropriately, substitute "should", "could", or similar less certain language. Why is the action to improve habitat values for sandhill cranes singled out?

Paragraph 5. The word "would" is used inappropriately in the text and was changed to "expected to" in the side bar, substitute "should", "could", or similar less certain language.

In line 1, are there any "indirect" protections, etc.?

Why is the example of the riparian brush rabbit called out?

In line 5, what "program" does this refer to?

The last sentence could be moved to the Delta section as explanation.

Page 6.2-29

Paragraph 1. In line 2, there is inconsistency in terminology. Throughout the vegetation and wildlife sections, "natural plant communities" has been used, not "native plant communities."

Water Quality Program, Page 6.2-29

Paragraph 2. The majority of this section could be placed in the Delta Region discussion as explanation.

In line 5 and the side bar, which "Program" is this, the Water Quality Program or the CALFED Program?

The last sentence refers to the paragraph below which, in turn, refers to another section.

Watershed Program, Page 6.2-29

Paragraph 5. The word "would" is used inappropriately in the text and in the side bar, substitute "should", "could", or similar less certain language.

Are the species referred to in line 3, the "target" species for the Conservation Strategy? If so, this could be clearly stated and referred to the appendix.

The last sentence, which continues onto the next page, is unclear and could be reworded.

Page 6.2-30

Paragraph 1. The word "would" is used inappropriately in the side bar, substitute "should", "could", or similar less certain language. In line 3, the reference to "limiting factors" confuses the reader.

In line 7, "higher value" should be better defined. Is this higher value for wildlife?

In lines 6 and 8, the words "presumed" and "assumed" are used in the impact discussion. One cannot assume that actions will occur. Impacts needs to be clearly written and mitigations clearly defined, thus avoiding the need for presumption or assumption.

Paragraph 2. The word "would" is used inappropriately, substitute "should", "could", or similar less certain language. At the end of the paragraph a reference to where the reader can find mitigation for this impact would be appropriate.

Paragraph 3. The word "would" is used inappropriately, substitute "should" or similar less certain language. Calling Program actions "improvements" assumes that impacts will be beneficial before impacts have been assessed.

Will the construction of erosion control structures and channel realignments not have any potential for adverse effects?

What about impacts to special status species and significant natural areas?

Storage, Page 6.2-30

Paragraph 4. The word "would" is used inappropriately in the text and side bar, substitute "could" or similar less certain language. What about impacts to special status species and significant natural areas? There is no determination of significance for this impact, although it appears to be beneficial.

Page 6.2-31

Paragraph 1. At the end of the paragraph a reference to where the reader can find mitigation for this impact would be helpful.

Paragraph 2. The word "would" is used inappropriately and in the first line, "could potentially" is repetitive, substitute "could" or similar less certain language.

In line 9 and the side bar, the text references "some reservoir sites under construction" which seems to indicate that the construction has already begun for these projects before the PEIS/EIR is finalized. If that is the case, were they documented under previous NEPA/CEQA documentation?

Paragraph 3. In line 4, does "they" refer to spreading grounds?

The last sentence discusses low forage and cover values due to lack of vegetation. But don't mudflats, generally devoid of vegetation, provide excellent foraging habitat for many waterfowl and shore birds?

Paragraph 4. What does "Changes in project operations" in the first line refer to? What changes to what operations?

6.2.7.4 Other SWP and CVP Service Areas

GENERAL COMMENTS, Page 6.2-32

This section is extremely general and does not attempt to assess any impacts to these areas. It should not indicate that there are only less-than-significant impacts because impacts have not been assessed. In this case, the section should discuss that there

are potential impacts expected in these areas that will be assessed in future environmental documentation as specific sites and project actions are determined.

6.2.8 Consequences: Program Elements That Differ Among Alternatives

6.2.8.1 Preferred Program Alternative

GENERAL COMMENTS

As in the other impact sections, The word "would" is frequently used inappropriately, substitute "should", "could", or similar less certain language where appropriate.

Page 6.2-32

Paragraph 4. There is no determination of significance for this impact discussion.

Paragraph 5. Where is Old River? It is not discussed or shown on a map in the Affected Environment/Existing Conditions section.

This paragraph contains several separate impacts, and some discussion of mitigation, all distinct ideas that should be separated. The initial impact discussion does not have an associated determination of significance (first three sentences). The next sentence is a mitigation measure.

The remainder of the paragraph (continuing onto page 6.2-33) is a well-thought-out and well-written impact statement. It presents the potential impact, describes what resources are involved and how they could be affected, and finally contains a statement of the level of significance.

Page 6.2-33

Paragraph 1. At the beginning of this discussion on page 6.2-32, it indicates that all of this section refers to the Delta Region, while this paragraph refers to the other SWP and CVP areas. At the end of the paragraph a reference to where the reader can find mitigation for this impact would be helpful.

Paragraph 2. Place names are found within this paragraph that are not found in the Affected Environment/Existing Conditions section.

There is confusion in this paragraph regarding the types of habitats being lost and those being created, often the same habitat type. The side bar and the following paragraph offer a clearer explanation for this discussion.

Paragraph 3. Place names are found within this paragraph that are not found in the Affected Environment/Existing Conditions section.

This paragraph contains a concise, clear explanation of the impact, including a statement of significance.

(Top of page 6.2-34). The last sentence could be deleted.

6.2.8.2 Alternative 1

Paragraph 2. In line 1, the text refers to "improvements," an assumption that the project will result in a better situation before impacts have been assessed.

In lines 3-5, the text indicates that 4,000 to 5,000 acres "would remain unchanged" under alternative 1. This suggests that they would remain in the existing condition, not in the condition of the No Action Alternative.

6.2.8.3 Alternative 2

Paragraph 4. In line 1, would impacts be "the same" or "similar"?

The last few words of the paragraph are confusing. It is difficult to determine whether the word "range" refers to the general region, or the range of canal capacities.

6.2.8.4 Alternative 3

Paragraph 5-6. These both refer to "improvements" that "would" result from Program actions. It appears as though CALFED has already determined what actions will happen, and that they will be beneficial before the impact assessment has been completed.

(Continuing onto page 6.2-35) There are no determinations of significance for these impacts. There are two impact ideas together in the last sentence that should be separated.

6.2.9 Program Alternatives Compared to Existing Conditions

GENERAL COMMENTS

This section seems to exist for appearances only. It is not clear that any analysis was done. The text states that the impacts would be the same when compared to the Affected Environment/Existing Conditions as when compared to the No Action Alternative. This suggests that the No Action poses no different circumstances to the environment than the Affected Environment/Existing Conditions. Yet the discussion in Section 6.2.6 of the No Action Alternative discusses impacts that could result that are not presently a part of the Affected Environment/Existing Conditions. This also goes back to the lack of detail in the analysis of impacts from the No Action Alternative. There seems to be an agreement that the No Action Alternative could pose significant threats to biological resources, or why is ecosystem restoration a main focus of the Program?

In paragraph 3 the text states that the Program alternatives "did not identify any additional potentially significant environmental consequences." Were there possibly any fewer significant impacts? This section seems poorly thought through.

The list of impacts given at the bottom of page 6.2-35 refers to what other list of impacts? It does not match up with any other list of impacts in the section, including those in the summary (Section 6.2.1) or Sections 6.2.7 and 6.2.8. It most closely resembles a combination of the significance criteria and the summary section. There are many problems with these bulleted items, including:

1. The third item is never discussed as an impact in other sections.
2. In the forth item, what are "important wildlife habitat use areas" and how do they relate/differ from wetland and riparian communities (items 1 and 5), rare natural communities and significant natural areas (item 7), and habitat for special-status species (items 6 and 10).
2. The difference between items 1, 4, 5, and 7 is not apparent.
3. In item 10, be consistent with terminology for special-status species.

As was discussed in these comments under Section 6.2.7, there is inconsistency in the way impacts are presented which makes them unclear to the reader. Sometimes the impact is presented by the cause of the impact (e.g., construction) and sometimes by the affected resources (e.g., wetland and riparian communities). Sometimes permanent versus temporary affects are distinguished, sometimes direct versus indirect.

1. There are no beneficial impacts presented in this section.

6.2.10 Additional Impact Analysis

CUMULATIVE IMPACTS

Page 6.2-36

Paragraph 1. In line 4, the text refers the reader to Section 3 and Attachment A. The only information in Section 3 for cumulative impacts to vegetation and wildlife resources is a table on page 3-28 with 4 check marks on it. It appears that very little cumulative impact analysis was completed for these resources.

Attachment A is a list of projects that may contribute to cumulative impacts on resources in the Program study area. This list could have been used to complete a more detailed analysis of cumulative impacts to vegetation and wildlife resources.

Paragraph 2. In line 3, projects discussed as part of cumulative analysis do not have to be "related" to the currently proposed project. They only need to occur within the same study area or affect the same resources.

Paragraph 3. This paragraph lists a number of projects and then concludes they are not part of cumulative impact analysis. If that is so, why are they discussed here at all?

Paragraph 4. The word "would" is used inappropriately in this paragraph (line 8) and twice in the side bar. In the side bar, the combined use of would (or could) and potentially is redundant. Substitute "could", or similar less certain language, where appropriate.

GROWTH INDUCING IMPACTS

Page 6.2-36

Paragraph 5. In the first line, the text states that the Program "is expected to improve vegetation" Doesn't the Program actually result in less vegetation by increasing aquatic habitats? How does this "improve vegetation"?

The beginning of the second sentence is confusing. Is converting farmland part of the program or is it "in addition" to program actions?

Page 6.2-37

Paragraph 1. The first line again discusses "improvements to vegetation"

Paragraph 2. The word "would" is used inappropriately on the first line, substitute "could", or similar less certain language.

The relationship or difference between "wetland and riparian communities" and "important wildlife habitats and use areas" needs to be defined, preferably in the Affected Environment/Existing Conditions section.

Paragraph 3. In line 4, what is the "proposed action"? The Program? The Preferred Program Alternative?

SHORT- AND LONG-TERM RELATIONSHIPS

Page 6.2-37

Paragraph 4. The word "would" is used inappropriately here, substitute "should", "could", or similar less certain language.

This entire paragraph is incredibly difficult to understand and should be rewritten for the benefit of the reader. What are examples of "best onsite land, vegetation, habitat, and wildlife management practices"? What types of "adaptive measures" could be used?

The sentence that begins "The overall benefits . . ." is poorly worded and makes one think that the benefit to "productivity of any facilities" could benefit biological resources.

Paragraph 5. In the first line, should Ecosystem Restoration Program be replaced with Program (CALFED Program) and the Ecosystem Restoration Program?

(Continuing onto page 6.2-38) In the first line on page 6.2-38, what is "or their resources?"

At the end of line 1, shouldn't long-term adverse impacts be avoided as much, if not more than, short-term adverse impacts?

In line 3, does "program" refer to the CALFED Program or the Ecosystem Restoration Program?

Page 6.2-38

Paragraph 1. This paragraph is redundant with part of the previous paragraph. See comment above regarding the avoidance of short- and long-term adverse impacts. The same comments apply to the side bar.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS

Paragraph 2. In line 3, the text refers to "short-term direct habitat losses" that could result from construction. How are construction losses short-term? These should be long-term losses.

In line 7, change "pre-existing conditions" to "existing conditions." The goal of the Ecosystem Restoration Program is to establish some "pre-existing conditions."

The next sentence, beginning "However, restoration activities would not proceed . . ." begs the issue of further environmental documentation. Why not state that further documentation will be completed as appropriate when specific project sites and activities are identified? Also, there is no way "designers (will be) confident of the desirability of the results." This is refuted in the next sentences, and should be.

What is "adaptive management" in line 9? Perhaps "monitoring" would be a clearer choice of words, or give examples of what this may entail.

In line 9, does "the Program" refer to the Ecosystem Restoration Program?

Paragraph 3. Throughout this paragraph the Program (CALFED Program) appears to have been confused with the Ecosystem Restoration Program, as well as the phrase "restoration actions" which may also refer to the Ecosystem Restoration Program.

Why isn't the adaptive management program discussed before here? Is it meant to be a mitigation measure? That is not clear. The first time the adaptive management program is referred to, there should be a reference to the Revised Phase II Report Appendix.

Paragraph 4. The last sentence refers to mitigation measures without referencing where they can be found.

6.2.11 Mitigation Strategies

GENERAL COMMENTS

The mitigation measures should be clearly identifiable as relating to specific impacts or types of impacts. Although this is a programmatic document and cannot attain the level of detail of other projects, the current section on mitigation measures is inadequate even for a programmatic document. It is impossible to ascertain how the mitigation measures could bring the level of impacts to a less-than-significant level. Most of the time, it is impossible to determine what types of impacts could be mitigated with which types of mitigations.

Perhaps it would be useful to number the mitigation measures, as has been done to make comments simpler to follow. By numbering the mitigation measures, they can be referred to throughout the text, as opposed to current statements like "see the mitigation section." This could add a great deal of clarity and definition to a report that is seriously lacking both.

It is unclear how some of the mitigation measures are different than others. There seem to be repeated mitigation measures, and measures that are a subset of others. This will be expanded upon below for each mitigation measure.

There should also be a mitigation measure or general discussion regarding the need for future environmental documentation when specific project sites and activities are identified.

Page 6.2-39

Paragraph 2. The first sentence does not appear to be accurate. How could one tell which mitigation goes with what impact? Are impacts defined at each paragraph in Sections 6.2.7 and 6.2.8? There is no way to know what each impact is, or how the mitigation measures match up to those impacts. In the summary, there are clearly more mitigation measures than defined impacts. Incredibly confusing.

The third sentence appears to be a mitigation measure in itself.

Paragraph 3. Using "potential" and "may" here is redundant.

Mitigation Measure #1. Appropriate mitigation measure, no comments.

Mitigation Measure #2. Appropriate mitigation measure, no comments.

Mitigation Measure #3. In line 2, "In some instances, for example" is redundant.

Mitigation Measure #4. It is not clear how this is different from #2.

Mitigation Measure #5. Giving examples in this mitigation measure is great but inconsistent with the way other measures are presented. Either use examples for all measures (when possible) or for none of them.

Page 6.2-40

Mitigation Measure #7. This sentence is incredibly convoluted and could be rewritten to make sense for the reader.

Mitigation Measure #8. What are "important wildlife habitat areas"? This should be discussed in the Affected Environment/Existing Conditions section so that this mitigation measure will be clear.

Mitigation Measure #9. How does this mitigation differ from restoration of habitat (#2, 4, 5, and 6)? It appears that the problem here is related to a problem in the impact sections. Impacts should be organized either by the resource being potentially affected, or by the cause (e.g., construction). Using a mixture is not only confusing to the reader; it often creates a situation of repetitive impacts and mitigation measures, which seems to be the case in Section 6.2.

Mitigation Measure #10. It is not clear whether "habitat areas within affected watersheds" includes wetland and riparian habitats, although such would appear to be the case. If so, then how does this mitigation differ from #2 and 3?

Mitigation Measure #11. How does this differ from #1?

Mitigation Measure #12. How does this differ from #2?

Mitigation Measure #13. How does this differ from #2 and 12?

Mitigation Measure #14. First, how does this differ from #2? Second, how will vegetation disturbed by construction be restored? Won't construction remove vegetation and replace it with a structure of some sort? Isn't this a direct, permanent, irreversible impact?

Mitigation Measure #15. Good. This mitigation measure is clear and concise.

Mitigation Measure #16. How will these habitats be defined? Will they be surveyed for each project? How do we know where these habitats are? They aren't in the Affected Environment/Existing Conditions, nor are they delineated in the Conservation Strategy. It is likely that many of these areas have not ever been surveyed. This measure is insufficient.

Mitigation Measure #17. This problem is related to one in the significance criteria. Are indirect impacts that cause the loss of special-status species not considered significant impacts? The CDFG and the USFWS seems to agree that these do constitute significant impacts, in which case this mitigation measure may be insufficient to mitigate these impacts to a less-than-significant level.

Page 6.2-41

Mitigation Measure #18. See the above comment for #17.

Mitigation Measure #19. Appropriate mitigation measure, no comments.

Mitigation Measure #20. See the above comment for #17.

Mitigation Measure #21. Appropriate mitigation measure, no comments.

Mitigation Measure #22. How does the Program presume to alter agricultural practices? As discussed for #6, this needs to be a feasible mitigation measure, not a vague idea that is insupportable.

Mitigation Measure #23. How does this differ from #8?

Mitigation Measure #24. This appears to suggest that these areas will be restored, then adversely affected by the Program, suggest modifying the term "other locations" by changing to "other, remote, locations".

Mitigation Measure #25. This makes much more sense than the previous mitigation measure.

Mitigation Measure #26. How does this differ from #17?

Mitigation Measure #27. This measure needs to be reworded to make it clear that it is the sensitive features being demarcated, not the construction areas. What are the sensitive features? They were not discussed in the Affected Environment/Existing Conditions section.

Mitigation Measure #28. This mitigation measure is far too general. The BMPs should themselves be discussed a separate mitigation measures and not just grouped into a nebulous BMP category. It is not sufficient to simply say, "We'll do the right thing."

Mitigation Measure #29. How does this differ from #2 and all others that discuss habitat enhancement? Isn't that always the reason for enhancement?

6.2.12 Potentially Significant Unavoidable Impacts

Page 6.2-42

GENERAL COMMENTS

This section appears to gloss over the potential for extreme adverse impacts to biological resources, particularly from reservoirs should they be constructed. The text indicates that impacts may occur, but seems to state that they could be minor, when they would likely be huge. It appears as though there is also the potential for large losses of special-status species and their habitats, large areas of wetland and riparian habitats, and large areas of other sensitive habitats such as significant natural areas.

Paragraph 2. In line 7, "could" and "potentially" are redundant. This section should reference the need for further environmental documentation when specific project sites

and activities are identified.

CHAPTER 7 - LAND USE, SOCIAL ISSUES, AND ECONOMICS

7.1 AGRICULTURAL LAND AND WATER USE

GENERAL COMMENTS

The conclusions presented are very general, with little or no supporting documentation. There are not even references to either the *Draft Technical Report Affected Environment – Agricultural Resources* (March 1998) or to the *Technical Report Affected Environment – Agricultural* (March 1998). It is impossible from the information presented in the PEIS/EIR to be able to compare the potential impacts on agricultural land and water use among the alternatives.

This section of the document is completely lacking any sources, references, or citations of information, including in many of the tables. In addition, some of the tables do not give the year(s) of the data.

7.1.1 Summary

This section only summarizes the very broad, basic potentially significant impacts associated with the Preferred Program Alternative. It gives no details of these impacts, nor does it identify any impacts of the alternatives. The idea should be to provide the reader with a summary allowing for an easy comparison of impacts of each of the alternatives and their appropriate mitigation measures. There is very little of substance offered to the reader/decision-maker.

7.1.2 Areas of Controversy

The disclosure of the disagreement among experts is well stated.

7.1.3 Affected Environment/Existing Conditions

Data is presented in various tables for the five project study areas (Delta Region, Bay Region, Sacramento River Region, San Joaquin River Region, and Other SWP and CVP Service Areas). However, the data is not compared to any other area, such as the State, as a basis of comparison and perspective. While data is presented in tables, the data is often not discussed or interpreted in the text. Some statements should be presented, informing the reader why the data is important, and what is its point or relevance. Differences in the data among the five regions are not discussed nor explained (nor compared to the state as a whole).

Improvements to the tables are warranted. For example:

- Table 7.1-1 *Important Farmland in the Central Valley* should include the year of the data (1996) in the title for clarity for the reader.
- The data in Table 7.1-2 *Irrigated Acres and Production Value in All Programs, 1986 to 1995* covers a 10-year span, but none of the years are identified for any of the data items. The data should be presented for comparable time periods, with the variations noted.

The data in the tables in the *Technical Report Affected Environment – Agricultural Resources* (March 1998) need improvement as well. Numerous tables of data are presented with no interpretation of the data. For example, the data presented in Table 7 *Number of Farms, Farm Sizes, and Farm Ownership in All Regions, 1987 and 1992* is not discussed. Ownership Status for Tenants declined slightly for the Sacramento River Region while it went up for the other regions. Why? What was happening statewide during the same period? Full Ownership in the San Joaquin River Region went from 20,942 in 1987 to 9,144 in 1992. What happened to cause such a huge drop there, while the Full Ownership numbers stayed stable in the other regions?

Table 8 *Farm Income and Production Expense in All Regions, 1987 and 1992*, in the *Technical Report Affected Environment – Agricultural Resources* (March 1998) compares 1987 and 1992 dollar amounts. It would help facilitate comparisons if the 1992 data were presented in terms of 1987 dollars, so the changes could be meaningfully compared. The data presented in this table does not account for inflation.

Maps of each of the regions, showing their principal communities, water sources (e.g., rivers), and agricultural areas would be helpful to orient the reader.

7.1.3.2 Delta Region

Current existing conditions are summarized here better than for the other regions. This is true in the *Technical Report Affected Environment – Agricultural Resources* (March 1998) for the Delta Region as well.

7.1.3.3 Bay Region

On page 7.1-9, there is reference to the average cost of surface water, with a comparison made to the average in California. However, the cost for California is not given. Comparisons are made between the cost of groundwater in the Bay Region and the Delta and Sacramento River Regions, but their numbers are not presented. A table would be appropriate here, presenting the costs of both surface water and groundwater for the five regions as well as for the State.

7.1.3.4 Sacramento River Region

Historic crops in the region (1946-1950) are discussed, however, the current leading crops in the area are not mentioned. Is the region still a major rice-growing area? This section is supposed to cover existing conditions.

7.1.3.5 San Joaquin River Region

Similarly, there is no discussion of the current major crops/agricultural uses in the Region.

7.1.4 Assessment Methods

The definitions of direct impacts and indirect effects are poorly worded. The statement is made on page 7.1-12: "For this analysis, direct impacts are those that would occur if any of the alternatives, or combinations of alternatives, are implemented." This definition is much too broad. It would seem that *any* impact would then be a direct impact. A better definition might be: Direct impacts are those that would occur *at the same time and place* if any of the alternatives, or combinations of alternatives, are implemented.

Evapotranspiration should be defined/explained for the lay reader. Footnotes or references should be cited to support statements, such as: "Very little of the evapotranspiration requirements of aquatic habitat is supplied from rainfall because rainfall occurs when the water supply conditions are not limited." This statement seems to have the reasoning reversed. Shouldn't it be that *when* rainfall occurs, the water supply conditions are not limited, rather than rainfall occurs when water supply conditions are not limited. I suggest they move the word "when" to precede the word "rainfall."

The discussion of the open-water evaporation and wetlands evapotranspiration impacts is not appropriate in the Assessment Methods section. That discussion belongs in an impacts analysis section. A clearer explanation of the impacts assessment methods is warranted.

7.1.5 Significance Criteria

The reader should be reminded that economic and social impacts are not considered potentially significant impacts under NEPA and CEQA. It could still be helpful to establish significance criteria thresholds. Under these criteria, *any* "Permanent or long-term reduction in agricultural acreage in a region," or *any* "Adverse effects on agricultural resources or operations" would be *substantial* impacts. Some threshold limits should be established.

7.1.6 No Action Alternative

The discussions of the Regional losses of agricultural land should include percentages in addition to the total amounts of land lost. This would help clarify the magnitude of the losses for the reader.

7.1.6.3 Sacramento River and San Joaquin River Regions

There should be references cited for supporting documentation. An example here is the statement: "It has been estimated that up to 1 million acres of agricultural land in the Central Valley could be converted within the next 40 years." Estimated by whom? Is it a credible source? Later in this section they state: "In addition, it is estimated that 45,000 acres of drainage problem lands in the San Joaquin River Region will be retired by 2020." Again, estimated by whom?

Table 7.1-4 is confusing. Further, it seems to be an estimation based on an estimation.

7.1.6.4 Other SWP and CVP Service Areas

Again, estimations of future conversions of agricultural lands are presented with no supporting documentation or justification for the estimate. Upon what information are the estimates based?

7.1.7 Consequences: Program Element Common to All Alternatives

GENERAL COMMENTS

In general, estimates of affected acreages are given, but there is no supporting documentation for any of the estimates, including indications of upon what the estimates are based. Thus, it is impossible to evaluate the estimates for reasonableness or relative accuracy.

The information is presented in very general terms, and with no way to discern the differences among the alternatives. This should be done even if the program elements are common to all the alternatives. Surely the agricultural land and water uses in each of the regions would be affected somewhat differently by each of the alternatives. This section should be a key section for aiding the public and decision-makers, even at the program level, to distinguish among alternatives and make informed choices.

There are appropriate tables of data in the *Draft Technical Report Affected Environment – Agricultural Resources* (March 1998), which could have been presented and discussed in the document, which would help the reader/decision-maker see the differences among project alternatives and configurations more clearly. These tables include the following:

- Table 6 Summary of Potential Impacts on Agricultural Water Use in All Regions
- Table 7 Summary of Potential Impacts on Agricultural Revenues and Costs in All Regions
- Table 8 Summary of Potential Impacts in the Delta Region
- Table 9 Assumed Additional Yield Delivered for Irrigation by Region and Configurations
- Table 10 Summary of Potential Impacts on Agricultural Resources in the Bay Region
- Table 11 Summary of Potential Impacts on Agricultural Resources in the Sacramento River Region
- Table 12 Summary of Potential Impacts on Agricultural Resources in the San Joaquin River Region
- Table 13 Summary of Potential Impacts in the SWP and CVP Service Areas Outside the Central Valley

7.1.7.2 Delta Region

Finally, there seems to be some "hard data" on the effect of the Ecosystem Restoration Program on the Delta Region, rather than generalities. However, the numbers on page 7.1-18 in the references to Table 4-2 do not correspond to the numbers in the actual table. It is confusing for the reader to follow how these numbers were attained. Totals are given for aquatic and riparian habitat restoration targets, supposedly derived from Table 4-2, but there is no indication of what habitat types they grouped to get the totals presented in the text on page 7.1-18.

On the same page, under the *Water Quality Program* and in the *Levee System Integrity Program*, future estimates of affected acres are again given with no supporting basis for the statement, or explanation of how the estimate was derived.

Potential impacts in the *Water Transfer Program* are discussed in the most generalized terms, with no attempt to present any information on issues such as anticipated magnitude of impact, areas of greatest potential impact.

7.1.7.3 Bay Region

The conclusion regarding habitat restoration in the Bay Region is supported by the information presented in the section of *Ecosystem Restoration Program*. However, the following section on *Watershed, Water Transfer, Water Quality, and Water Use Efficiency Programs* simply states that no impacts on agricultural land and water use

are anticipated. There is nothing given, or referred to, to support this statement. It needs to be substantiated. Similarly, there is only one sentence on *Storage* impacts, considered to be beneficial. Is that all there is to say on this subject in the Bay Region?

7.1.7.4 Sacramento River Region

The discussion of the *Water Quality Program* should be expanded to discuss the mercury and heavy-metal drainage problems. The issue is raised but is not explained in any way. How would the problems be addressed? This might include a reference back to page 2-9 of the document where Water Quality Program actions are presented, including reducing mercury levels in rivers and the estuary by source control at inactive and abandoned mine sites.

7.1.7.5 San Joaquin River Region

The discussion of the impacts in this sub-section, while not documented in any way, is more substantial than in the previous sections, and is satisfactory at the programmatic level. Estimates of the magnitude of the impacts are presented, and the rationale for the estimates is included.

In reference to *Storage*, the document states: "Neither a cost analysis nor a willingness-to-pay study has been completed. Consequently, the allocation of new water by region is uncertain." Will a cost analysis or a willingness-to-pay study be conducted at a later time? At the project-specific environmental documentation level?

7.1.7.6 Other SWP and CVP Service Areas

The statement is made that: "No impacts on agricultural land and water use in the Other SWP and CVP Service Areas are associated with Ecosystem Restoration, Water Quality, or Watershed Program actions." There should be some supporting evidence/rationale for this statement. This is the impacts analysis section of the document. There should be some indication that the conclusion was reached based upon analysis.

7.1.8 Consequences: Program Elements that Differ Among Alternatives

Supporting documentation or explanations should be supplied for statements such as:

Delta Region – "Changes in project operations are not anticipated to adversely affect agricultural land and water use." Why not?

Bay Region – "No impacts on agricultural land and water use are anticipated in the Bay Region from the Conveyance element." Why not?

They could alternatively state that the Conveyance element would not be applied in the Bay Region, and therefore there would be no effect from it upon agricultural land and water use. It clarifies the situation for the reader.

San Joaquin River Region – “Changes in project operation may affect agricultural land and water use in the San Joaquin River Region.” Why/How?

Other SWP and CVP Service Areas – “Changes in project operations may affect agricultural land and water use.” Why/How?

There is no explanation why or how changes in project operation will not affect the Delta Region while they will affect the San Joaquin River Region and the Other SWP/CVP Service Areas. The reader needs more information.

The discussion of the three alternatives is quite minimal and is of scant value to the decision-maker. The alternatives are superficially compared to the Preferred Program Alternative, but it is not readily apparent where the analysis of the Preferred Program Alternative is discussed. A section should at least be referred to where the reader can find the analysis of the Preferred Program Alternative (Section 7.1.9.1?).

7.1.9 Program Alternatives Compared to Existing Conditions

Again, the impact analysis is minimal, although the Section 7.1.9.4 Alternative 3 is a little more substantial than the other two alternative sections.

7.1.10 Additional Impact Analysis

This section, while brief, seems adequate for a programmatic level environmental document. It should be stated, however, that these topics, particularly cumulative impacts and growth-inducing impacts, would be discussed in greater detail in the later project-specific environmental documents.

7.1.11 Mitigation Strategies

Mitigation measures should be related back to the specific significant and potentially significant impacts that have been identified. Even though it states that specific mitigation measures will be adopted for site-specific projects, these mitigation measures should be organized and grouped to apply to the identified significant impacts. Page 7.1-2 presents “Potentially Significant Adverse Impacts and Mitigation Strategies Associated with the Preferred Program Alternative,” and at least identifies three

potentially significant adverse impacts and the associated mitigation measures applicable to those three impacts. This information should be expanded in this section of the PEIS/EIR.

It should be shown how the measures would reduce the impacts, and the level of impact after application of the mitigation measures should be identified. This involves referral back to the significance criteria to determine if the impacts have been mitigated to a level below significance. Since no significance criteria thresholds were established, this cannot be accomplished adequately.

7.2 AGRICULTURAL ECONOMICS

GENERAL COMMENTS

We recognize a basic premise of the analysis for this section, that while this programmatic document should fully discuss social and economic issues as required by NEPA, consistent with federal and state law, the document does not treat them as significant environmental impacts. In 40CFR§1508.14 Human environment, NEPA regulations state "economic or social effects are not intended by themselves to require preparation of an environmental impact statement."

It should be noted that this section does not include a sub-section on Mitigation Strategies. It is not clear whether this is an oversight or whether the decision to exclude mitigation measures was based on the concept that there are no significant environmental impacts from social or economic effects. The omission should be explained or corrected.

7.2.3 Affected Environment/Existing Conditions

Data presented in *Table 7.2-1 Number of Farms, Farm Sizes, and Farm Ownership in All Regions, 1987 and 1992* could be further discussed in each of the regional sections. Ownership Status for Tenants declined slightly for the Sacramento River Region while it went up for the other regions. Why? What was happening statewide during the same period? Full Ownership in the San Joaquin River Region went from 20,942 in 1987 to 9,144 in 1992. What happened to cause such a huge drop there, while the Full Ownership numbers stayed stable in the other regions? This is an anomaly that should be explained, if possible. It is not enough to just present data like this for the reader to interpret on their own. This section is supposed to describe the affected environment, interpreting data for the reader and putting the information into the proper context. It is interesting to note that the Average Farm Size went up for all regions, despite the drop in acreage of Land in Farms, except for the Other SWP and CVP Service Areas.

Table 7.2-1 should also include the total ownership, to facilitate verification of the percentages of full ownership for the reader.

Table 7.2-2 Farm Income and Production Expense in All Regions, 1987 and 1992 compares 1987 and 1992 dollar amounts. It would help facilitate comparisons if the 1992 data were presented in terms of 1987 dollars, so the changes could be meaningfully compared. The data presented in this table does not account for inflation. In addition, the 1987 "Other" Total Production Expense for San Joaquin River Region is misplaced.

It would help the reader to understand the data presented in the tables and in the text if the terms used were consistent. For example, *Table 7.2-2* uses "farm income," "production expenses," and "agricultural product value." The text describing this data for the region uses "agricultural revenues," "production costs," and "agricultural sales."

In *Section 7.2.3.3 Sacramento River Region*, according to Table 7.2-2 Total Farm Income decreased in the Sacramento River Region from 1987 to 1992, while it increased in the other regions during the same period. Is there an available explanation? Their Net Cash Return also decreased by more than 50 percent, from \$617 million to \$304 million during that period. This should be included in the discussion.

In *Section 7.3.2.4 San Joaquin River Region*, it should be noted that the number of farms in full ownership decreased from 20,942 in 1987 to 9,144 in 1992. Some explanation of this huge drop should be offered, if available. Full ownership of farms in all of the other regions remained relatively stable during the same period.

Section 7.2.3.5 Other SWP and CVP Service Areas does not include the percentage of farms in the region that are operated by full owners. Net Cash Return in this region also decreased, although not as dramatically as in the Sacramento River Region. This could be pointed out.

7.2.4 Assessment Methods

The PEIS/EIR is supposed to be a stand-alone document. As such, the assessment methods for the Agricultural Economics analysis are not described in any detail. The statement is made: "All of the potential effects described in this section are based on review of and experience with other studies." However, none of the studies are cited. There is more information available in the March 1998 Technical Report on Agricultural Resources than is presented here that would be of value to the reader, including differences among the alternatives.

7.2.5 Criteria For Determining Adverse Effects

It should be noted again for the reader that NEPA/CEQA do not consider economic or social impacts to be *significant* impacts or effects, and thus this section only identifies adverse impacts. However, threshold limits should still be set for the criteria presented, in order to identify "adverse" impacts. Without some threshold, any effect would be included, and some screening is needed. There are industry standards that could be applied to set thresholds, in order to determine the level below which an effect would be considered adverse. The only reference to thresholds, while not discussed in the text, is in *Table 7.2-3 Major Crops in the Delta Region and Corresponding Threshold Salinity Level*.

7.2.6 No Action Alternative

The following statement is made without any reference, support, or rationale: "*Changes in the agricultural market* – Demand for fruits and vegetables will increase, resulting in a

shift away from field crops and grain production." It needs some supporting documentation.

7.2.7 Consequences: Program Elements Common to all Alternatives

The programmatic-level discussion of the Delta Region *Ecosystem Restoration Program*, although very general, provides good coverage. It is discussed in more detail, including possible mitigation measures, than the other programs in the Delta Region.

The effects upon the Bay Region are presented in the broadest generalities, without supporting documentation to help the reader evaluate the validity of the statements. For example, the evaluation of the *Water Transfer Program* states: "Because of the water supply deficiencies in some agricultural areas, water transfers may be an important future source of water in the Bay Region. The region is more likely to be a recipient than a source of water transfers." Which agricultural areas have water supply deficiencies? Why is the region more likely to be a recipient? If the supporting documentation is given elsewhere in the document, then at least the reference to the location should be given.

Much of the material presented for the above regions is restated for the remaining regions. The same comments apply.

7.2.8 Consequences: Program Elements That Differ Among Alternatives

Graphics illustrating the major differences among alternatives would be very helpful to reader. For example, the statement is made in Section 7.2.8.1 Preferred Program Alternative: "Agricultural lands in the Sacramento River and San Joaquin River Regions could be adversely affected by the location of new connector canals that would connect new storage facilities to existing conveyance facilities." Maps indicating the general alignment of potential new connector canals and the proposed locations of potential new storage facilities could be presented.

Page 7.2-25 states: "Agricultural water supply impacts would vary by alternative, based on differences in the configuration and operation of conveyance." This is where it would be very important to present information on the differences by alternative. Some data is available in the March 1998 Technical Report on Agricultural Resources, and would be useful to the reader here. If the decision were made not to include the data, at least the reader should be referred back to the Technical Report for more information.

The statement is repeated over and over that the agricultural economic effects are similar under each of the alternatives to those described for the Preferred Program Alternative. *Differences* should be highlighted for the reader, perhaps in a matrix, to facilitate comparative evaluation of the alternatives.

7.2.9 Program Alternatives Compared To Existing Conditions

As stated, the analysis found that the effects of implementing the Program alternatives were the same when compared to the existing conditions as when compared to the No Action Alternative, and no real information was presented to allow the reader to reach any conclusion on their own.

7.2.10 Additional Impact Analysis

The discussion of cumulative Impacts ends with the statement: "The cumulative impacts of land conversion are described in more detail in Section 7.1, Agricultural Land and Water Use." However, that section does not discuss the cumulative impacts in sufficient detail. The other impact issue areas are also given only cursory attention.

7.2.11 Adverse Impacts

This section should identify "Potentially Significant Unavoidable Impacts." As stated earlier, it is difficult to identify significant adverse impacts without some threshold standards of significance. Further, it would not be possible to evaluate the effectiveness of mitigation measures without those thresholds. If impacts are considered significant, it should be so stated.

The statement is made that: "These effects would be most concentrated and most substantial in the Delta Region." A summary statement of why this is so is needed for the reader.

7.3 AGRICULTURAL SOCIAL ISSUES

GENERAL COMMENTS

This section correctly reminds the reader that social and economic effects under CEQA and NEPA are not treated as significant environmental effects.

This document has taken the issue of Community Stability and described it for the entire study area, rather than on a regional basis. This seems antagonistic to the concept of "community" stability. It would be so even to discuss it at the regional level. Perhaps, given the general level of discussion in this programmatic document, it would be best to state that community stability will be dealt with on a more localized area level in the project-specific environmental documents.

Page 7.3-3 states: "In all regions, pockets of prosperity have an 'averaging effect' of raising average personal income levels and lowering average poverty and unemployment rates." It should be noted that the pockets of prosperity only have a statistical effect, and do not have an economic effect of raising income or lowering poverty or unemployment.

Table 7.3-2 Existing Conditions: Regional Demographics and Economic Indicators of Social Well Being, presents poverty rates for the five regions, but does not indicate a source for the data, or the year of the data. All of the indicators are presented for different years, which is an awkward way to present data. If possible, data should be for consistent years, to present a more accurate picture of the economic conditions. The table should also include the same components for the state, as a basis for comparison. Poverty rates should be defined. Is it the percentage of total population, or of households, below the Census-defined poverty level?

Tables 7.3-3 Poverty Rate by Ethnicity should be correctly titled "1980 Poverty Rate in California by Ethnicity," and *Table 7.3-4, Unemployment by Ethnicity* should be titled "1980 Unemployment Rate in California by Ethnicity." Table 7.3-4 incorrectly labels the rate as "Poverty Rate" instead of "Unemployment Rate."

In *Table 7.6 Racial Distribution of Farm Workers by Program Region*, the total percentages of races for each region do not equal 100 percent, and range from 99.4 percent to 99.8 percent, which would not be explained by rounding. In addition, the totals across add up to 148,090 total Number of Farm Workers, not 148,440. Something is missing and should be explained. Furthermore, for consistency, all percentages should be presented to one decimal place. Statewide racial distribution should be included, for comparison.

The material in the tables is not adequately explained in the text. What does the data tell us about the regions? Why are the data important?

Data are presented for each of the Program Regions; however, little of the data is analyzed as to what it says about the region. Regional differences are not discussed or explained.

It should be noted that this section does not include a sub-section on Mitigation Strategies. It is not clear whether this is an oversight or whether the decision to exclude mitigation measures was based on the concept that there are no significant environmental impacts from social or economic effects. The omission must be explained or corrected.

7.3.4 Assessment Methods

Key indicators of community stability also include home ownership and tenure patterns. There are no data presented on these indicators.

7.3.7 Consequences: Program Elements Common to all Alternatives, and

7.3.8 Consequences: Program Elements That Differ Among Alternatives

Data, as noted previously, is presented with no citations or references, nor indications of how the figures were calculated. For example, amount of farmland acreage to be lost, and the number of jobs that could be lost from conversion of farmlands are presented with no documentation. Thus it is very difficult to evaluate the validity of the data or the statements presented.

7.3.10 Additional Impact Analysis

As with other sections, there is very little of substance presented. Minimal information is presented in the discussion of Cumulative Effects and Growth-Inducing Effects. Much more could be said on both these topics.

7.3.11 Adverse Impacts

Considering that economic and social effects are not considered significant under CEQA and NEPA, the summary paragraph here is probably sufficient, for a programmatic-level environmental document.

7.7 RECREATION RESOURCES

Summary Section

In Section 7.7.1, page 7.7-2, please explain why the permanent closure of some recreational facilities was not considered a potentially significant unavoidable adverse impact? This certainly would be unavoidable and significant.

Affected Environment/Existing Conditions

Existing Conditions appear to be adequate, although we question why the discussion of commercial fisheries is included in this section.

Significance Criteria

Please explain why the significance criteria in the March 1998 Technical Report on page 5 do not match the EIS/EIR significance criteria listed on page 7.7-17? Please explain the omissions from the current EIR/EIS.

For example, and specifically, changes in recreational opportunities due to reduced average flows in rivers used by boaters (March 1998 report) is as important, if not a more important criteria, as changes in lake or reservoir water levels, or river temperature. Please explain the omission. Also, why is a temporary restriction of recreation activities due to construction listed, yet the permanent loss of a recreational facility not? Page 7.7-22, first paragraph, states that "Certain recreational facilities, such as piers or marinas, would be temporarily or permanently closed following restoration actions."

No recreation economic evaluation criteria was presented in the EIR/EIS, yet the March 1998 criteria discuss impacts to fish, wildlife, and recreation economics with a specific criteria of 10 percent or more in recreation spending or recreation benefits. First, why is this not presented in the EIR/EIS, and second, why is there not a criteria presented for a possible loss in recreation economics? This certainly may be a possibility at some location within the project area. In fact, on page 7.7-28, top two paragraphs, there are mentions of spending reductions related to the Water Use Efficiency and Water Transfer Programs. Also, economic information is presented in existing conditions, leading the reader to believe that economics of recreation is evaluated in the analysis of this section. Note Section 7.7.2, page 7.7-3, last paragraph of the page, third line from the bottom, "At the programmatic level of analysis, any potential adverse effect on recreational opportunities that substantially affects individuals or businesses dependent on recreation activity for their livelihood is considered a potentially significant impact." Please explain why this is not listed under significance criteria.

The significance criteria in the EIR/EIS are thus not complete, leaving the adequacy of the analysis suspect. Plus, as noted in the paragraph above, there has not been a careful review of the text, resulting in the omission of a criteria discussed in

Section 7.7.2, but not included in the significance criteria listing. This lack of careful review by the EIR/EIS preparers also leaves the reader suspect of the completeness of the thought processes used in the conveyance of potential impacts.

Impact Assessment

Thoughts presented in the impacts section are general and vague and not substantiated by fact. Conclusions are not related to impact significance criteria. We cite as an example, Section 7.7.7.3, page 7.7-28, the Storage discussion. In the second paragraph, there is discussion of the potential impacts of new storage facilities. While there may be an overall beneficial impact to recreational use in the Sacramento and San Joaquin River Regions (as stated in the third paragraph), there may also be potentially significant impacts on select areas due to construction and operation of new reservoirs. These would include loss of land associated with inundation, displacement of recreational opportunities, and other items as presented in the second paragraph. Yet, the conclusion is that these would be considered less than significant. There is no substantiation given as to why these would be less than significant. Please explain.

Certainly, when looking at the significance criteria, one would think that there could be potential impacts as would be the case in reading line four of the second paragraph which states, "Changes in reservoir operations could affect existing minimum pool levels and adversely affect recreational opportunities related to specific water surface elevations, including access to marinas and boat launching facilities." Then consider the significance criteria: "Fluctuation in lake or reservoir water levels," and "Changes in accessibility to recreation sites." Certainly, localized impacts will occur, yet this is not identified as a potentially significant impact. Even though this is a Program level NEPA analysis, the thought process to substantiate conclusions must be clear. The current text appears to "write off" many potential impacts. Part of the reason for this is the very general nature of the discussions. Substantiation for the conclusions presented must be brought into the text and related back to the significance criteria. The document should be revised, otherwise it may be deficient and flawed under NEPA.

As mentioned above, the existing conditions section and the March 1998 Technical Report lead the reader to think that economics are evaluated in the Recreational Resources section.

Quantification is presented of the potential recreational areas in the project regions in the March 1998 Technical Report. Why is there not an attempt to quantify, by giving a range, the potential impacts to recreation? Why was this information gathered if no attempt at a quantified analysis was to be prepared?

The presentation of cumulative impact is very weak and deficient. A major intent of a program level environmental document is to analyze cumulative effects. The entire document is deficient in this respect.

Mitigation Strategies

The mitigation strategies are adequate but not complete. While there may be an overlap with other disciplines (such as biological resources, water quality, etc.), other pertinent strategies should be presented. This is very important since the development of recreation program plans will refer to these strategies as guidance for the new programs.

The mitigation strategies focus on recreational improvements and enhancements (without being specific), boating, and access, but do not present strategies related to fish and wildlife enhancement as pertaining to areas where there may be fish and wildlife displacement (which is listed as a potentially significant impact on page 7.7-37).

Technical Reports

Comments on the March 1998 Technical Report are incorporated above.

7.7.1 Summary

In Section 7.7.1, page 7.7-2, please explain why the permanent closure of some recreational facilities was not considered a potentially significant unavoidable adverse impact? This certainly would be unavoidable, and significant, according to the criteria threshold presented. In Section 7.7.5 *Significance Criteria*, it states: "Program actions would result in a potentially significant adverse impact on recreation resources if recreation opportunities at affected facilities were substantially reduced...." Under this criterion, the permanent closure of recreational facilities would be considered an unavoidable significant impact.

7.7.3 Affected Environment/Existing Conditions

Existing Conditions appear to be adequate, although we question why the discussion of commercial fisheries is included in this section. The issue of impacts upon commercial fisheries, which is an important issue, should be given a full discussion, somewhere in the document. A cross-reference should be included, informing the reader where the impacts to commercial fisheries are discussed in greater detail.

7.7.5 Significance Criteria

Please explain why the significance criteria in the March 1998 Technical Report on page 5 do not match the EIS/EIR significance criteria listed in page 7.7-17? Please explain the omissions from the current EIS/EIR. For example, and specifically, changes in recreational opportunities due to reduced average flows in rivers used by boaters (March 1998 Technical Report) is as important, if not a more important criterion, as changes in lake or reservoir water levels, or river temperature. Please explain the

omission. Also, why is a temporary restriction of recreation activities due to construction listed, yet the permanent loss of a recreational facility not? Page 7.7-22, first paragraph, states that "Certain recreational facilities, such as piers or marinas, would be temporarily or permanently closed following restoration actions."

No recreation economic evaluation criteria was presented in the EIS/EIR, yet the March 1998 Technical Report criteria discuss impacts to fish, wildlife, and recreation economics with a specific criterion of 10 percent or more in recreation spending or recreation benefits. First, why is this not presented in the EIS/EIR, and second, why is no criterion presented for a possible loss in recreation economics? This certainly may be a possibility at some location within the project area. In fact, on page 7.7-28, in the top two paragraphs, there are mentions of spending reductions related to the Water Use Efficiency and Water Transfer Programs. Also, economic information is presented in existing conditions, leading the reader to believe that economics of recreation is evaluated in the analysis of this section. Note Section 7.7.2, page 7.7-3, last paragraph of the page, third line from the bottom, "At the programmatic level of analysis, any potential adverse effect on recreational opportunities that substantially affects individuals or businesses dependent on recreation activity for their livelihood is considered a potentially significant impact." Please explain why this is not listed under significance criteria.

The significance criteria in the EIS/EIR are thus not complete, leaving the adequacy of the analysis to be suspect. Plus, as noted in the paragraph above, there has not been a careful review of the text, resulting in the omission of a criteria discussed in Section 7.7.2, but not included in the significance criteria listing. This lack of careful review by the EIS/EIR preparers also leaves the reader suspicious of the completeness of the analysis processes used in the conveyance of potential impacts.

7.7.7 Consequences: Program Elements Common to all Alternatives, and

7.7.8 Consequences: Program Elements That Differ Among Alternatives

Statements presented in the Consequences section are general and vague and not substantiated by fact. Conclusions are not related to impact significance criteria. We cite as an example, Section 7.7.7.3, page 7.7-28, the Storage discussion. In the second paragraph there is discussion of the potential impacts of new storage facilities. While there may be an overall beneficial impact to recreational use in the Sacramento and San Joaquin River Regions (as stated in the third paragraph), there may also be potentially significant impacts to select areas due to construction and operation of new reservoirs. These would include loss of land associated with inundation, displacement of recreational opportunities, and other items as presented in the second paragraph. Yet, the conclusion is that these would be considered less than significant. There is no substantiation given as to why these would be less than significant. Please explain.

As mentioned above, the existing conditions section and the March 1998 Technical Report lead the reader to think that economics are evaluated in the Recreational Resources section.

Quantification is presented of the potential recreational areas in the project regions in the March 1998 Technical Report. Why is there not an attempt to quantify, by giving a range, the potential impacts to recreation? Why was this information gathered if no attempt at a quantified analysis was to be prepared?

7.7.10 Additional Impact Analysis

The presentation of cumulative impact is very weak and deficient. A major intent of a program level environmental document is to analyze cumulative effects. The entire document is deficient in this respect.

7.7.11 Mitigation Strategies

The mitigation strategies are adequate but not complete. While there may be an overlap with other disciplines (such as biological resources, water quality, etc.), other pertinent strategies should be presented. This is very important since the development of recreation program plans will refer to these strategies as guidance for the new programs.

The mitigation strategies focus on recreational improvements and enhancements (without being specific), boating, and access, but do not present strategies related to fish and wildlife enhancement as pertaining to areas where there may be fish and wildlife displacement (which is listed as a potentially significant impact on page 7.7-37).

7.9 POWER PRODUCTION AND ENERGY

General

The adequacy of the section is hard to determine based on the level of detail provided. Assumptions for details of the analysis are completely lacking. The section is simply a summary of the results, with no reference to other studies. It is not clear if the impact analysis was derived from the March 1998 Technical Report.

Summary Section

It appears from the information presented that the information summarized is not carried forward in detail in the analysis of impacts. For example, one bullet item discussed changes in stream flows that could cause beneficial or adverse effects at downstream or other facilities. Yet, the analysis appears to ignore further discussion of this potential impact, presenting only cost information. Please provide more information on each of the bulleted items on how the various alternatives will be affected and resultant potential impacts to energy providers.

Affected Environment/Existing Conditions

No references for information are provided. Reliance is placed on the March 1998 Technical Report.

Assessment Methods

The assessment methods explanation lacks the specifics of what was used in the actual assessment. For example on page 7.9-7, second full paragraph, it states that "Power plants that may be modified were identified, and the existing and proposed nameplate capacities were defined in MW. Changes in capacity and energy generation were defined that would be caused by changes in system operations." Where is this information presented? Certainly such information was used to generate tables 7.9-1 through 7.9-3, however, without presentation of such information, there is no basis for determining the adequacy of the analysis. Please provide all assumptions used in the analysis.

Impact factors for air emissions are presented. Why are no other assumptions specified throughout this section? What is the range of operational scenarios that have been defined and modeled to characterize the effects of the alternatives? What assumptions were used for the future price of power in California's deregulated power markets? What publicly available analyses of future power prices in the restructured industry were evaluated and why is a reference not provided? How exactly was the range of future prices determined, and is this for 2020?

Significance Criteria

Significance criteria should be simply stated. A discussion is fine, however, a presentation of the exact criteria that were used is difficult to find within all the text.

Impact Assessment

The entire section is presented as a summary based on the modeling and assumptions. No hard data is presented. Substantiation of conclusions is missing. When referring to the March 1998 Technical Report, more explanation is provided, however, even the March 1998 report is a summary document. The detailed assumptions that were used in the analysis need to be presented. Because the March 1998 Technical Report analyzed 12 alternatives, and thus, does not relate directly to the current action, there is need for preparation of a revised technical report so that readers can better understand how each of the various program actions for the current alternatives relate to energy use, and how they interact with elements within each alternative. Please provide this revised document in the Final EIR/EIS.

On page 7.9-20 examples of energy-related effects that would occur once efficiency measures are implemented are presented. Please explain the assumptions used to make these determinations. What guarantees are in place to assure compliance with such measures? Please explain how they would be implemented and who would have responsibility for assuring success. It appears that these are broad statements. If there is no guarantee that efficiency measures may be implemented or implemented successfully, then the CALFED should assume worst case in the analysis and address what would happen with no or a limited amount of energy efficiency measures being implemented.

Some detail is finally presented in a short table (Table 7.9-4) at the end of the impacts analysis. This table presents some specific energy impacts as related to other project and associated power plants. We understand that the analysis presented was regional in scope, however, it appears that underlying assumptions were used that would allow for identification of those potential facilities which could be affected by the various scenarios assumed in the modeling and the impacts analysis. The potential for each of the alternatives to affect the various power and energy resources as depicted in Figure 1 of the March 1998 Technical Report need to be presented. Please identify these facilities and the range of potential direct and indirect consequences to each for each of the alternatives.

There are no criteria presented in the significance criteria section to make a determination on whether or not potentially significant unavoidable impacts would result. Clarification should be added to Section 7.9.12, in that there is a potential for such impacts to occur, however, based on the level of analysis at this time, no specific unavoidable impacts have been identified. It is erroneous to assume that no significant unavoidable impacts will result without further analysis.

Mitigation Strategies

It appears that mitigation strategies should be incorporated to minimize power demands through a carefully thought out and detailed planning process. Due to the size of the Program, there should be strategies incorporated that require the Program to work with power providers to maximize and incorporate energy efficiency measures within the Program itself, as well as outside of the Program.

Technical Report

As noted at the beginning of the review comments for this section, the March 1998 Technical Report needs to be revised to reflect the current alternatives. It is not clear what may have changed or have been modified for the current text in the EIR/EIS. It is also cumbersome and confusing to try to determine which aspects of the previous alternative configurations now apply to the current alternatives. This constrains this current review.

A revised technical report should be incorporated with the Final EIR/EIS. The revised technical report needs to detail the assumptions used throughout the analysis. Such as what assumptions were used for modifications of existing power plants and the basis for these assumptions? What was assumed as far as projected changes in monthly and annual energy use? What are the operational scenarios that were modeled and the assumptions? The revised technical report also needs to include modeling runs.

GENERAL COMMENTS

The adequacy of the section is hard to determine based on the level of detail provided. Assumptions for details of the analysis are completely lacking. The section is simply a summary of the results, with no reference to other studies. It is not clear if the impact analysis was derived from the March 1998 Technical Report.

7.9.1 Summary

It appears that the information presented is summarized, and not carried forward in detail in the analysis of impacts. For example, one bullet item discussed changes in stream flows that could cause beneficial or adverse effects at downstream or other facilities. Yet, the analysis appears to ignore further discussion of this potential impact, presenting only cost information. Please provide more information for each of the bulleted items on how the various alternatives will be affected and resultant potential impacts to energy providers.

7.9.3 Affected Environment/Existing Conditions

No references for information are provided. Reliance is placed on the March 1998 Technical Report.

7.9.4 Assessment Methods

The assessment methods explanation lacks the specifics of what was used in the actual assessment. For example on page 7.9-7, second full paragraph, it states that "Power plants that may be modified were identified, and the existing and proposed nameplate capacities were defined in MW. Changes in capacity and energy generation were defined that would be caused by changes in system operations." Where is this information presented? Certainly such information was used to generate tables 7.9-1 through 7.9-3, however, without presentation of such information, there is no basis for determining the adequacy of the analysis. Please provide all assumptions used in the analysis.

Impact factors for air emissions are presented. Why are no other assumptions specified throughout this section? What is the range of operational scenarios that have been defined and modeled to characterize the effects of the alternatives? What assumptions were used for the future price of power in California's deregulated power markets? What publicly available analyses of future power prices in the restructured industry were evaluated and why is a reference not provided? How exactly was the range of future prices determined, and is this for 2020?

7.9.5 Criteria for Determining Effects

Significance criteria should be simply stated. A discussion is fine, however a presentation of the exact criteria that were used is difficult to find within all the text.

7.9.7 Consequences: Program Elements Common to all Alternatives, and

7.9.8 Consequences: Program Elements That Differ Among Alternatives

The entire section is presented as a summary based on the modeling and assumptions. No hard data is presented. Substantiation of conclusions is missing. When referring to the March 1998 Technical Report, more explanation is provided, however, even the March 1998 report is a summary document. The detailed assumptions that were used in the analysis need to be presented. The March 1998 Technical Report analyzed 12 alternatives, and thus, does not appear to be related directly to the current action. There is need for preparation of a revised technical report so that readers can better understand how each of the various program actions for the current alternatives relate to energy use, and how they interact with elements within each alternative. Please provide this revised document in the Final EIR/EIS.

On page 7.9-20, examples of energy-related effects that would occur once efficiency measures are implemented are presented. Please explain the assumptions used to make these determinations. What guarantees are in place to assure compliance with such measures? Please explain how they would be implemented and who would have responsibility for assuring success. It appears that these are broad statements. If there is no guarantee that efficiency measures may be implemented or implemented successfully, then the CALFED should assume worst case in the analysis and address what would happen with no or a limited amount of energy efficiency measures being implemented.

Some detail is finally presented in a short table (Table 7.9-4) at the end of the impacts analysis. This table presents some specific energy impacts as related to other project and associated power plants. We understand that the analysis presented was regional in scope, however, it appears that underlying assumptions were used that would allow for identification of those potential facilities which could be affected by the various scenarios assumed in the modeling and the impacts analysis. The potential for each of the alternatives to affect the various power and energy resources as depicted in Figure 1 of the March 1998 Technical Report need to be presented. Please identify these facilities and the range of potential direct and indirect consequences to each for each of the alternatives.

7.9.11 Mitigation Strategies

It appears that mitigation strategies should be incorporated to minimize power demands through a carefully thought out and detailed planning process. Due to the size of the Program, these should be strategies incorporated that require the Program to work with power providers to maximize and incorporate energy efficiency measures within the Program itself, as well as outside of the Program.

7.9.12 Potentially Significant Unavoidable Impacts

There are no criteria presented in the significance criteria section to make a determination on whether or not potentially significant unavoidable impacts would result. Clarification should be added to Section 7.9.12, in that there is a potential for such impacts to occur. However, based on the level of analysis at this time, no specific unavoidable impacts have been identified. It is erroneous to assume that no significant unavoidable impacts will result without further analysis.

Technical Report

As noted at the beginning of the review comments for this section, the March 1998 Technical Report needs to be revised to reflect the current alternatives. It is not clear what may have changed or have been modified for the current text in the EIR/EIS. It is also cumbersome and confusing to try to determine which aspects of the previous alternative configurations now apply to the current alternatives. This constrains this current review.

A revised technical report should be incorporated with the Final EIR/EIS. The revised technical report needs to detail the assumptions used throughout the analysis. Such as what assumptions were used for modifications of existing power plants and the basis for these assumptions? What was assumed as far as projected changes in monthly and annual energy use? What are the operational scenarios that were modeled and the assumptions? The revised technical report also needs to include modeling runs.

7.10 REGIONAL ECONOMICS

Section 7.10.2 *Areas of Controversy* correctly states that opinions concerning the correct size of economic multipliers differ among technical experts. The document, however, does not discuss economic multipliers, so the reader has no chance to review and evaluate the data effectively.

The same section goes on to explain that nothing can really be done to address areas of controversy at the programmatic level of analysis. As presented in this document, regional economic effects focuses on the *local* systems of producing, delivering, and trading goods and services. Those effects, including the external effects of Delta land conversion, cannot be evaluated until the specific locations and projects have been determined.

It should be noted that the Regional Economics Technical Report was not available for review.

It should be noted that this section does not include a sub-section on Mitigation Strategies. It is not clear whether this is an oversight or whether the decision to exclude mitigation measures was based on the concept that there are no significant environmental impacts from social or economic effects. The omission must be explained or corrected.

7.10.3 Affected Environment/Existing Conditions

Graphics, including maps and tables, would help summarize the data, and make it easier for the reader. However, the data presented in tables should be clearly interpreted. Table 7.10-1 *Regional Economic Levels under Existing Conditions, 1992 Dollars*, presents a lot of information with no explanation of either the categories of data presented or what the data say about the regions. Why are these factors important and why were they selected to be included in the table? For example, what does the column "Final Demand (billion dollars)" represent? What is the difference between "Employment Compensation Income" and "Place of Work Income?" The text presents additional data, which does not correspond to the data in this table. It is confusing for the reader. The source and the year of the data in Table 7.10-1 should be included with the table. Although it is expressed in 1992 dollars, it is not necessarily 1992 data (the title says "Existing Conditions" which still does not indicate the year).

The data in Table 7.10-1 is not discussed in the text for Section 7.10.3.1 *Delta Region*, however, it is stated in other sections, including 7.10.3.2 *Bay Region*, although no explanation of what the data means is presented.

A map showing the service areas receiving SWP and CVP water would be helpful for Section 7.10.3.5, *Other SWP and CVP Service Areas*.

7.10.4 Assessment Methods

Given the limited scope of this programmatic-level environmental document, the section of Assessment Methods in *Section 7 Land Use, Social Issues, and Economics* presents satisfactory information, including the assumptions upon which their estimates are based. However, the section does not show how they calculated effects such as the losses in the Delta Region as a result of the Ecosystem Restoration Program. This section should give more complete methodologies, which could then be evaluated.

7.10.5 Criteria for Determining Effects

No indication of any thresholds is provided. Thus there is no way to identify the level or magnitude of the impact, nor to determine if the impact is substantial. The reader should be reminded that NEPA does not consider economic or social impacts to be significant environmental consequences of a project. However, thresholds should still be established, as stated, to estimate the magnitude of the impact. The statement is made: "The significance of employment effects on social well-being is discussed in Section 7.3, Agricultural Social Issues." However, it is not really discussed there, even though a more extensive discussion is warranted.

7.10.6 No Action Alternative

The document states: "It is assumed that the California economy will continue to grow at a rate similar to the forecasted rate of population growth, but the No Action Alternative regional economic structure is assumed to remain the same as existing conditions." It is further acknowledged that "Based on past trends, it might be assumed that manufacturing, agriculture, and mining would continue to decrease in relative importance while government and services increase. This continued trend is not reflected in this analysis...." This is a basic weakness in their approach. The trend should have been reflected in the analysis. It may explain why there is so little difference between the comparison of Alternatives to the No Action Alternative and the comparison of Alternatives to the Existing Conditions. The No Action Alternative is supposed to represent conditions in the future (in this case, year 2020) if the project is not implemented. It does not equate to existing conditions.

7.10.7 Consequences: Program Elements Common to all Alternatives

Some alarming statistics are presented for the direct and indirect effects of the Ecosystem Restoration Program on the Delta Region, yet there is no reference cited for the statistics or any explanation of how the numbers were derived. If the numbers are correct, the program would have a substantial impact upon the Delta Region economics, including the loss of approximately \$120 to \$500 million in "output," 10,000 to 20,000 jobs, and approximately \$200 to \$400 million in personal income. These losses would be due primarily to agricultural land conversion. No further information is

provided, even at the programmatic level, that would give any indication of where these impacts would be likely to occur, for example.

Table 7.10-2, Regional Economic Levels under the No Action Alternative, 2020, 1992 Dollars is presented, with no sources of data given, and no discussion of how the projections were developed. As with *Table 7.10-1*, no explanations or definitions are provided for the categories selected. The projected data in the table are not discussed in any detail in the text.

Statements are made, such as "Total water supplies for all users would increase from 600 to 800 TAF on average and by over 1 MAF in some critical years" (page 7.10-13). At least, it should state that it is *estimated that....* As noted elsewhere, there is no supporting documentation cited for this and other such statements.

7.10.8 Consequences: Program Elements That Differ Among Alternatives

Only the discussion of *7.10.8.4 Alternative 3, Delta Region* includes a slightly more specific discussion of distinctions between Alternatives 2 and 3. Projects are cited but there is no map to help orient the reader. All in all, there is not sufficient data for the reader to distinguish between alternatives and their impacts.

7.10.9 Program Alternatives Compared to Existing Conditions

As noted, there is little information presented to compare the program alternatives and their effects.

7.10.10 Additional Impact Analysis

This section provides only the broadest generalities. Statements are made that should be explained, expanded, supported. For example, in the discussion of Cumulative Effects, it's stated: "The Program and other projects would change water supply and recreation spending – in particular, the CVPIA, Delta Wetlands, American River Watershed, Supplemental Water Supply, and Pardee Enlargement Projects. These changes would result in beneficial effects from the perspective of regional economies." Much more could be said here to explain to the reader how or why these changes would result in beneficial effects on a regional basis.

7.10.11 Adverse Effects

The one sentence in this section seems to downplay the findings stated in Section 7.10.7.1 on the Delta Region. Much more should be said in this section.

CHAPTER 12 - BIBLIOGRAPHY

In the beginning of Section 12, there is reference to those disciplines of the Draft Programmatic EIS/EIR that have background technical reports. These are the reports that were prepared for the March 1998 Draft Programmatic EIS/EIR. It is not clear what these reports are. The EIS/EIR preparers should present this information, and give the full bibliographic references, especially since the Draft Programmatic EIS/EIR summarizes those reports from the March 1998 version which were not revised.

CHAPTER 13 - INDEX

This appears to be merely a detailed Table of Contents. The document would be better served if this were located in the front, where the current Table of Contents is now located. A proper index provides the location of topics, organized by alphabetical order of topic. According to the "40 Questions" a keyword index is not required, but the index must provide "...a level of detail sufficient to focus on areas of the EIS of reasonable interest to any reader. As currently structured, a reader would often need to infer from the current list of topics to find subjects that are clearly within the scope of the document, but are not called out with specificity in the current "Index".

ECOSYSTEM RESTORATION PROGRAM PLAN - MAPS

GENERAL COMMENTS

It is unfortunate that these figures are so difficult to understand because good figures could make the complexity of the Ecosystem Restoration Program (ERP) and CALFED Bay-Delta Program much easier to grasp. Although this would require extensive improvements to the figures, it could be crucial to comprehending the ERP. These figures have information on them that is technically correct, but nearly impossible to decipher, even for people experienced at reading such maps. Certainly they would be indecipherable to the lay reader.

The Maps Appendix shows the 4 "Ecological Zones," then 15 "Ecological Management Zones" with 3 "Ecological Management Units" mixed in. The ERP Volume 1 talks about 14 Ecological Management Zones. Obviously these numbers are confusing and inconsistent. Figure 4 should be an Ecological Management Unit. It is confusing to have separate figures for the Ecological Management Units for one Ecological Management Zone (Sacramento-San Joaquin Delta), and not for the other Ecological Management Zones.

There is no map showing the relationship between Ecological Zones, Ecological Management Zones and Ecological Management Units. This figure might be the most useful in understanding the ERP. A color figure is recommended to show all Ecological Zones, Ecological Management Zones, and Ecological Management Units, eliminating the need for extensive study of the figures to try and tie this all together.

On nearly all figures, the shading on the "Location Map" in the upper right corner is indistinguishable. The figures are confusing with all the lines on them. Figure 6 is clearer than the other figures.

All maps are excessively complex because the words, shading, and rivers all run together with highways, towns, etc. If comprehending the details is difficult for someone experienced at looking at such figures, it is surely perplexing to the lay reader. Color figures are recommended, despite the additional cost. Color figures would particularly aid in identifying water boundaries, an essential aspect of the ERP and Program.

The legend is simply repeated on each figure despite many of the features not being on each figure, making many of the figures more difficult to read.

Nearly all figures list "Adjacent Ecological Management Units." Removing the adjacent areas is recommended, since the figure is confusing enough as it is. If there were a clear initial figure for readers to refer to, there would be no need for adjacent units on each figure, which would remove the need for the excessive map features.

The "Ecological Unit Names" in the legend must be clarified. It is unclear if these are the same as an Ecological Management Unit. Additionally, they are bold on some of

the figures and not bold in the legend. In addition, there are different font sizes in such figures as Figure 8.

Rivers and streams are also written in different fonts and sizes on different figures, with some easier to read than others (see Figure 12).

In most figures, the line depicting the valley floor perimeter is not found on the maps but is found in the legend. This feature is often confusing because it is not continuous on the figures.

For all figures, if there is no difference shown on the figures between interstate and state highways, why put both in the legend? It would be better to list "highways" with one line type.

Many figures have been created by "blowing up" sections of other figures and this has resulted in words being cut off along the edges, creating unnecessary confusion.

SPECIFIC COMMENTS ON EACH FIGURE

Figure 1. There are 12 Ecological Management Zones on the map that are clearly distinguishable, which is inconsistent with the 14 in the text. This figure should be the one to tie the ERP areas together by clearly showing Ecological Zones, Ecological Management Zones, and Ecological Management Units.

Figure 2. It is not at all clear that this is depicting four Ecological Management Units within one Ecological Management Zone, the Sacramento-San Joaquin Delta.

Figures 3-6.

- Words are sometimes cut off on the perimeters of the maps, making them look sloppy.
- Too much information is provided for adjacent areas, confusing the reader with the area that the figure focuses on.
- Remove the titles of the Ecological Management Units from the figures since the figures are titled with the Ecological Management Unit title and the appropriate area is shaded in.

Figure 7. See general comments above.

Figure 8. This figure is difficult to understand. What are the Ecological Management Units? There is confusion between adjacent Ecological Management Units and Ecological Management Zones.

- Many of the stream names are repeated twice on the figure to label also the associated Ecological Management Zone or Ecological Management Unit, but this is jumbled.
- There are features on the graphic that are not in the legend like the straight bar that is about ½ inch long and crosses the Sacramento River in several places, dividing Ecological Management Units.
- Because the figure is not in color, it is difficult to understand if the Ecological Management Zone is only the river itself or some of the adjacent area, as well as which part of the area.

Figure 9.

- Having the borders and names of the adjacent Ecological Management Units makes this figure confusing.
- It is hard to determine where the Ecological Management Unit boundaries are within the Ecological Management Zone because the shading is unclear, and the number and similarity of the wording in the graphic is confusing.
- It is difficult to read anything in the area of Redding, Sacramento River, and valley floor perimeter line.

Figure 10. It is hard to tell where the Ecological Management Unit boundaries are within the Ecological Management Zone because the shading is unclear and the number and similarity of the wording in the graphic is confusing. It is unclear what the importance of the valley floor perimeter is.

Figure 11. See general comments and above comments for Figures 9 and 10.

Figure 12. For some creeks in this figure, font and clarity are better and not confusing (Pine Creek, Rock Creek, Little Chico Creek, Angel Slough). If all the creeks had this type of font and clarity, the figures would be much easier to read.

Figures 13-15. See general comments and above comments for Figures 9 and 10.

Figure 16. See general comments and above comments for Figures 9 and 10. On the chart on page 3 of Volume 2 of the ERP, there are 3 Ecological Management Units in this Ecological Management Zone, but the Calaveras is not on the figure.

Figure 17. See general comments and above comments for Figures 9 and 10. This figure is difficult to understand. What are the Ecological Management Units? Why are they listed in the legend for Figure 8 along the Sacramento River with river miles and distances, but not here?

- There are features on the graphic that are not in the legend like the straight bar that is about ½ inch long and crosses the San Joaquin River in several places.
- Because the figure is not in color, it is difficult to understand if the Ecological Management Zone is only the river itself or some of the adjacent area, as well as which part of the area.

Figure 18. See general comments and above comments for Figures 9 and 10. In the figure, there are 4 Ecological Management Units, while on the table on page 3 of Volume 2 of the ERP there are 3, with the exception being Cowchilla/Fresno Rivers.

Figure 19. See general comments and above comments for Figures 9 and 10. "West San Joaquin Basin" is written redundantly, twice on the figure and once in the title.

LEEVE SYSTEM INTEGRITY PROGRAM PLAN

Affected Environment/Existing Conditions

The affected environment and the existing conditions are defined and described thoroughly and in detail. These descriptions include historical accounts of the levee construction, the methods and materials used in their construction, the dewatering of the areas protected by the levees, subsidence of the levees and the protected areas, levee maintenance and the development of structural standards for levee stability. The critical natures of the levees in flood protection, channeling flows through the Delta, and the economic values of the agricultural products produced from the protected lands are described.

These descriptions quantify the miles of levees that exist and the number of acres of protected land. Maps and other illustrations, which clearly show the locations and features of the levees and the lands they describe and the channels they protect, support these physical descriptions. They also describe the problems that exist in maintaining the levees due to lack of funding and dispersed responsibilities among public and private agencies and districts. Many of the problems that exist in the maintenance of the levees are political. The need for improved coordination and support of levee maintenance by public and private sector agencies, stakeholders and beneficiaries is well and persuasively documented.

Assessment Methods

The methods of assessing the strengths and stability of the levees are based on modern, state-of-the-art civil engineering and geotechnical engineering analyses. The levees are vulnerable to damage and/or collapse due to earthquake shaking, foundation liquefaction failure, consolidation settlement, erosion, seepage induced internal erosion and piping through the levee and/or its foundation, overtopping due to flooding and/or high tides and high wind-driven waves. The Delta is in a seismically active area of the state. A panel of experts in seismology, earthquakes and geology prepared a state-of-the-art study of the seismicity of the Delta for this Levee system Integrity Program Plan.

Settlement of the land behind the levees has the effect of increasing the effective height of the levee and increasing their vulnerability to stability failure. The causes of settlement have been evaluated and methods for stopping and/or reversing settlement due to oxidation of the organic carbon in the peat have been and are being developed.

Significance Criteria

The significance of the levees is that they are essential to successful management of the Delta. If the levees were not there to protect the low lands and to channel flows through the Delta, it probably would be necessary to construct levees to channel the flow into manageable areas where control of the flow and distribution of the water could begin.

Impact Assessment

The PEIS/EIR clearly documents the direct and indirect impacts due to failure of a levee or the levees due to any cause. *Failure of a levee could result in flooding the protected land with saline waters which would impact not only the people involved in the agricultural activities, loss of their homes, crops and income, but it would also impact the reliability of the water supply and the water quality throughout the Delta.* The PEIS/EIR documents the impact such a change in Delta water quality and reliability would have on water deliveries to large portions of the state outside the Delta through the SWP and the CVP. The PEIS/EIR also documents the impact such a catastrophic levee failure would have since large amounts of fresh water would be needed to flush the delta and would deplete the volume of fresh water needed for other beneficial uses.

Mitigation Strategies

The levees are vulnerable to damage and/or collapse due to earthquake shaking, foundation liquefaction failure, consolidation settlement, erosion, seepage induced internal erosion and piping through the levee and/or its foundation, overtopping due to flooding and/or high tides and high wind-driven waves.

The Levee System Integrity Program Plan documents clearly that the primary mitigation strategy is to improve the stability of the levees by developing a Base Level Protection Plan. This plan would include reconstructing all levees up to a minimum structural section in accordance with the structural standards set forth in PL84-99. The Levee System Integrity Program Plan clearly emphasizes the necessity and the importance of regular inspection and at least annual maintenance to repair and maintain the levees in a state of structural stability. Because of the widely dispersed responsibility, the underfunded maintenance programs, and the lack of a coordinated, inter-agency emergency response plan the levees are particularly vulnerable at this time to any of the modes of failure outlined above. The document indicates that CALFED is planning on the development of a coordinated program for maintenance and emergency response among all agencies, stakeholders and beneficiaries involved.

Technical Reports

The Delta is in a seismically active area of the state. A panel of experts in seismology, earthquakes and geology prepared a state-of-the-art study of the seismicity of the Delta for this Levee System Integrity Program Plan

The Levee System Integrity Program Plan documents and clearly describes the following mitigation plans:

- Delta Levee Base Level Protection Plan
- Delta Levee Special Improvement Projects
- Delta Levee Subsidence Control Plan

- Delta Levee Emergency Management and Response Plan
- Delta Levee Risk Assessment and Risk Management Strategy

These plans are in the program development stage by CALFED staff and special working groups. Other special reports described in the Levee System Integrity Program Plan include Cost Analyses of various options and alternatives and analyses of Legal Aspects and Ramifications of these plans.

The Levee System Integrity Program Plan documents a study of the effects of Atmospheric Warming and Sea-Level Rise. The sea-level rise as a result of atmospheric warming is postulated to include the effect of expansion of the ocean water because of increase in water temperature, and also the effects of melting of the glaciers and the polar icecaps. The estimated rise in sea level because of climate warming is based on the EPA method, which can be found in an EPA publication "The Probability of Sea Level Rise" published in 1996

The information presented in the Levee System Integrity Plan and in the special reports is well documented and supports the conclusions presented in the PEIS/EIR.

Mitigation Strategies

Mitigation strategies are not addressed since specific impacts have not been identified. The Water Transfer Program Plan states that the extent of existing law is to prohibit transfers that adversely affect other legal users of water. Existing law also generally requires that significant adverse environmental impacts of transfers be identified and mitigated. The Water Transfer Program Plan describes the development of a series of actions to coordinate and to manage water transfers to minimize or mitigate adverse impacts.

Technical Reports

The technical report included with the Water Transfer Program Plan as written is the Excerpted Text from the California Water Code.

The Water Transfer Program consists of recommendations for actions, policies, and processes that provide a framework for solutions to the problems associated with a water transfer market. Before adopting a Record of Decision for the final Programmatic EIS/EIR, CALFED will finalize this plan for implementation of the Water Transfer Program.

WATERSHED PROGRAM PLAN

Affected Environment/Existing Conditions

The PEIS/EIR describes the scope of problems and solutions addressed by CALFED as, "any problem currently associated with (1) the management and control of water in the Bay-Delta, or (2) the beneficial use of water in the Bay-Delta (including both environmental and economic uses) is within the purview of the Program if at least part of the problem is located in the Bay-Delta or is associated with conditions in the Bay-delta." In contrast to the problem scope, the solution scope is very broad, potentially including any action that could help solve identified problems in the Bay-Delta.

The affected environment is described as the entire area drained by the Sacramento and San Joaquin Rivers and the streams tributary to the Bay-Delta system to the outlet at the Golden Gate. These watershed areas are clearly shown on a series of maps and described in the text of the PEIS/EIR.

Assessment Methods

The PEIS/EIR states that the goals of the Watershed Program are to provide both financial and technical assistance to local watershed programs that benefit the Bay-delta system. The Watershed Program Plan, PEIS/EIR Technical Appendix dated June 1999, describes the Watershed Program as programmatic actions in a long-term program. These programmatic actions are described in general terms without site-specific information as activities that help to achieve the mission and objectives of CALFED and help to coordinate and integrate existing and future local watershed programs.

Significance Criteria

Significance Criteria as such are not specifically addressed. However, the plan describes major program plans to improve and enhance local and regional watershed management, and preservation and enhancement of ecosystems thorough education and support for local programs. The goals of this program are to improve the reliability of the water availability, the quality of the water available and to develop long-term sustainability of the watershed.

Impact Assessment

Impacts and their assessment are not specifically addressed with regard to any specific or detailed activity. However, desired outcomes of the program are clearly described as beneficial to the entire Bay-Delta system. Therefore, qualitatively, any impacts resulting from implementation of the Watershed Program would be beneficial. By implication therefore, failure to implement the Watershed Program would not be beneficial and in the long term could have negative impacts on the Bay-Delta system and region.